ANALYSIS OF DATA COLLECTED FOR AVIAN COMMUNITY RESPONSE TO HABITAT VARIATION AND CONIFER SUCCESSION IN ASPEN FORESTS

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

FINAL REPORT

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INTRODUCTION

Commercial interest in logging aspen (*Populus tremuloides*) and, simultaneously, concern regarding the healthfulness of aspen forests in the Central Rocky Mountains motivated a study begun by the Research Work Unit Rocky Mountain 4201 in Laramie, WY in 1987. Habitat and bird count data from 30 plots in 2 geographical regions in the Central Rocky Mountains were collected for 3 consecutive years from 1987 to 1989. The study design included a 2-way habitat gradient: one dimension was geographic (North and South), while the second was forest type (pure Aspen forests, pure Conifer forests, and Mixed aspen/conifer forests).

To date, we know of no study of this breadth that quantifies the avian community response to habitat variation and conifer succession in aspen forests. Birds are considered particularly well-suited for a study of this nature because of their selective use of trees for nesting, perching, and as a source of food. The avian community can therefore be used as a descriptor of the value of the forest habitat.

This final report contains a statistical analysis designed to address the following questions:

1) What is the estimated density of each bird species by habitat and year?
2) Do densities of bird species vary across treetype, region, year, treetype by region, treetype by year, region by year, or treetype by region by year?
3) Is it meaningful to classify habitat based on densities of individual species?
4) Can some of the habitat variables collected be eliminated from analyses while essentially retaining all of the habitat information?
5) Which habitat variables can be used to predict the probability that a particular species will use a habitat?

Complete concise description and discussion of the statistical methods used and statistical results on all species are presented. In addition, the

results of three species are interpreted from a biological point of view to illustrate our deductive evaluation of the results. The appoach used here may be used to interpret results for each of the other species observed during this study.

Progress reports were issued periodically during the analysis (McDonald et al. 1991a, 1991b, 1992). Those reports contain additional information on data screening and intermediate results. File names, file structures, programs and flow charts describing file transformations are documented in notebook form by Mullen (1992). Those notes also contain information regarding names and location of output and listing files and a hard copy of all corrections made to data files.

FIELD METHODS

DEFINITION OF TERMS

Region: There were 2 geographically distinct areas: north and south. Northern plots were located in the Medicine Bow and Routt National Forests in S. Wyoming and N. Colorado. Southern plots were located in Grand Mesa, Uncompahgre and Gunnison National Forests in S. Central Colorado.

Treetype: There were two classes of trees, aspen (Populus tremuloides) and conifers [Engelmann spruce (Picea engelmannii) and/or subalpine fir (Abies lasiocarpa)], that were used to define three treetypes: aspen, conifer, and mixed.

Plot: Plots were categorized as one of three treetypes: aspen plots (90% aspen), conifer plots (90% conifers), or mixed plots (50% aspen and 50% conifer).

Habitat: A region/treetype combination defined a habitat. For example, north aspen plots are one habitat, south mixed plots are another, resulting in six different habitats.

Sampling Station: A single point within each plot where bird counts and habitat sampling were conducted.

PLOT SELECTION

Plots were subjectively selected in each region as representatives of the desired treetypes. Aspen plots were located in stands where approximately 90% of the trees were aspen. Conifer plots were located where trees were

approximately 90% engelmann spruce and/or subalpine fir. Mixed plots were located in stands where the tree composition was approximately 50% aspen and 50% conifer.

VARIABLE CIRCULAR PLOT METHOD

Variable Circular Plot is a method of censusing birds (Reynolds et al. 1980). The observers stood at the predetermined sampling points for 1 minute. One minute was estimated as the time needed to allow avian activity interrupted by observer movement to resume or return to normal. After the first minute, observers began an 8 minute count, remaining in the same location and recording all birds detected by sight or sound, and estimating the horizontal distance along the ground to the bird.

SAMPLING EFFORT

For each region there were nine aspen plots, three conifer plots, and three mixed plots. During 1987, there were 30 sampling stations per plot Each was visited five times. The number of sampling stations per plot was reduced to 15 in 1988 and 1989. The stations sampled in 1988 and 1989 were intended to be every other sampling station from the 1987 grid. However, minor deviations from the sampling protocol occurred. For example, if an observer went to the wrong station, then one station may have been sampled four times while one was sampled only once. In addition, some stations were not sampled five times (e.g., the protocol for collection of data required that weather meet certain conditions).

HABITAT VARIABLES

Habitat variables were measured at each sampling station. Measurements of understory variables were collected all three years along transect lines. Overstory and physical characteristics were collected in 1987 only, as they were expected to remain stable over the 3-year study period. Field methods for habitat variable collection are described fully in Finch & Reynolds (1987).

STATISTICAL METHODS

At the heart of the analysis was the estimation of bird densities. Information collected by the variable circular plot method was used to estimate the average detection probability of each bird species for each habitat. The estimated average detection probability was used to adjust bird

counts to consider birds not detected by the observer during the census. Estimated densities were then carried forward into Repeated Measures Analysis of Variance (RMANOVA) (Sas Institute 1989) and Cluster Analysis (CA) (Norusis 1990). These analyses allow us to examine the variabililty of bird species across treetypes, regions, years, and the interactions of these variables, and to attempt to clasify habitat based on densities of individual species.

As the study was designed and conducted, it was assumed that there might be redundancy (multicollinearity) in the information contained by the habitat variables. However, it was impossible to know which set of variables would describe the habitat with the greatest accuracy. Statistical techniques were used to reduce the number of habitat variables and multicollinearity. From this subset of habitat variables, habitat selection functions (Manly et al. 1989) were constructed for the three bird species chosen for biological interpretation. Habitat selection functions are models that predict the probability that a bird species will use a habitat. The same methodology described here can be used to model habitat selction functions for the other bird species.

COMPUTER, SOFTWARE, DATA FILES AND AUDITS

An IBM-compatible personal computer was used on this project with the software packages PC/SAS (SAS Institute 1989) and SPSS/PC (Norusis 1990). Bird count and habitat data files were copied onto the hard drive and checked for errors (McDonald et al. 1991a).

Two data checking procedures were conducted in order to compare the computer data files with the field collected data. A random sample of 0.1% of the bird count records and 0.4% of the habitat records was selected using SPSS/PC (Norusis 1990) SAMPLE command. These records were traced to the original data sheets and audited for accuracy. LOTUS 123 (Lotus Development 1989) was used to select random page numbers from the original data sheets to audit. These entire data sheets were compared to the computer records. As work progressed, additional detected errors were corrected (Mullen 1992).

Final data files are stored in ASCII format on 5 1/4 " or 3 1/2 " diskettes. Larger files or sets of files were archived with the program PKPAK

(PKWARE 1988). Those diskettes have the word "archived" on the diskette label. File names and formats are documented in Mullen (1992).

The new program DISTANCE (Laake et al. 1991) was chosen over the program TRANSECT (Burnham et al. 1980) because it is more accurate than the program TRANSECT for estimating bird densities from point count data (variable circular plot). The DISTANCE formulas take into account that the area of a circular plot surrounding the observer increases by multiples of pi for every unit increase in the radius (Laake, pers. commun. 1992).

DISTANCE (Laake et al. 1991) was tested by running example data from the Wildlife Monograph (Burnham et al. 1980). The RMANOVA routines in PC/SAS (SAS Institute 1989) and SPSS/PC (Norusis 1990) were also tested with example data (Milliken & Johnson 1984, Koch et al. 1989). Cluster analyses were compared on PC/SAS (SAS Institute 1989) and SPSS/PC (Norusis 1990).

SPECIES LISTS

A complete list of all bird species observed during the three years was compiled (Appendix A). Four-letter codes representing common species names were recorded during data collection. Observers used codes from a list compiled before the study, thought to include all birds that might possibly be observed, and created codes when new taxa were observed during the study. Observers also recorded sightings of other non-bird taxa, and used codes from a mammal list or made up their own codes. In cases where species could not be readily identified from the code used, the original data sheets were examined for comments that described the animal. Complete lists of all non-bird species observed during the 3 years (Appendix B) and vegetation recorded (Appendix C) were compiled as well.

SAMPLING EFFORT

To calculate bird densities, the program DISTANCE requires input of the area in each plot searched. Ideally, total area is the area of the variable

circular plot searched times the "sampling effort", the number of sampling stations on the plot times the number of times each station was visited (Appendix D):

$$A_i = \pi \times r^2 \times k \quad (1)$$

where: A_i = the total area searched at station i,
r = the radius of the circular plot, and
k = the sampling effort.

POOLING PLAN

The estimation methods used in DISTANCE (Laake et al. 1991) require independent observations of approximately 40 birds (or clusters of birds) in order to estimate the average detection probability of that bird species. Ideally, the density of each species would be estimated independently on each plot each year, allowing independent comparisons between plots and between years. There were 7 species that met these criteria. Based on assessment of species biology and habitat use for less common species, it was assumed that the probability of detection of a particular bird species was the same across years, plots, and regions for the same treetype. Therefore, observations were "pooled" across plots in a habitat, across years and plots in a habitat, or across years, plots and regions (Appendix E). Observations were pooled the minimum amount needed to accumulate enough observations to estimate the average detection probability. This process enabled detection probability estimation for an additional 18 species (Appendix E).

There were other species that could not be pooled as above to meet the required number of observations. It was assumed that birds of different species may have the same average detection probability if they have certain characteristics in common that would alert an observer to their presence. All bird species were categorized into 15 groups (Appendix E), based on their taxonomic and behavioral similarity in detectibility (D. Finch, pers. commun. 1992). Average detection probabilities for an additional 66 species were estimated by utilizing this pooling. For example, bird species that sing for about the same length of time and whose songs "carry" for about the same distance were pooled, birds that were most likely to be detected by flying over were pooled, and species in the same taxonomic family were often pooled. If a pooled group contained at least 40 observations without including

observations from common species whose average detection probability could be estimated separately, the common species were not included with the group. On the other hand, if a pooled group contained less than 40 observations without including the common species, the common species were pooled with the group for estimation of the average detection probability of the group. In addition, the average detection probability for each of the common species was estimated separately. For example, for group 7 in appendix E, the observations of Ruby-Crowned Kinglet were included with the other two Group 7 species to have at least 40 observations for each treetype. Similarly, Hermit Thrush and Western Tanager observations were pooled with group 8, Broad-Tailed Hummingbird observations with the Hummingbird Group, Warbling Vireo observations with the Vireo Group, and Red-Breasted Nuthatch with the Nuthatch Group. There were 24 species for which density could not be estimated because of small sample sizes in the pooled sets.

Pooling was used only to estimate the average detection probability; the densities were estimated by applying the estimated average detection probability correction factor to the number of birds actually observed on each plot for each year (see Density Estimates, this report).

DATA TRIMMING

Burnham et al. (1980) recommend "trimming" the distance data to about the 97th percentile by dropping the largest 3% of observed distances to detected individual birds. A few observations at distances much greater than most of the rest are probably "outliers": either it was very unusual to detect a bird at so great a distance, or an error was made estimating or recording the true distance. By truncating those observations, the average detection probability increases but the area searched decreases. The result of trimming is that density estimates tend to stabilize.

The 95th percentile of estimated distances to birds for all observations made over the 3 years and over all plots within a habitat was calculated for each habitat for each species (or group, for species that had to be pooled). Distances recorded in the variable circular plot method larger than the 95th percentiles were dropped from further analysis.

DENSITY ESTIMATES

A new data set was created from the original data set using the following criteria (Mullen 1992):

1) The observation was made while a census was under way (i.e. during the eight minute interval when the observer was counting);
2) The distance to the bird was greater than or equal to 0 (excluding missing distances);
3) The species was one that had enough observations to estimate an average detection probability, either by itself or by pooling its observations with other similar birds.

The program DISTANCE (Laake et al. 1991) was used to estimate the average probability that an observer detected a bird of a given species in a given treetype. Although the distance estimates were measured as a continuous variable, Laake (pers. commun. 1992) recommended assigning the observations to intervals and analyzing the frequency of observations in the intervals. The subjective choice of intervals was based on the following principles:

1) Estimates of distances close to the observer are more accurate than large values (estimates far away);
2) The area of the circle surrounding the observer increases by a multiple of π for every unit increase in distance away from the observer (radius);
3) The critical estimate is the intersection of the detection function at the origin (i.e. detection of a bird at the center of the circular plot); observations far away from the observer do not greatly influence the intersection at the origin;
4) Six intervals appears to be the optimum number to use in most cases. Too many intervals do not smooth the data adequately, while too few do not provide enough information concerning the detection probability model.

In general, intervals were chosen so that the interval width increased with increasing distance from the observer.

DISTANCE allows the model selected for estimating density to be specified by the user. Laake (pers. commun. 1991) recommended use of the

Hazard model with cosine adjustments for this data set. In order to insure that an adequate model was selected a chi-square goodness of fit test was used to assess the fit of the model, with a significance level of 0.05. If the model did not fit, the following steps were implemented one at a time until a fit was achieved:

1) Interval widths were adjusted so that numbers of observations in each interval were approximately equal.
2) The original intervals were used with the half-normal model with cosine adjustments.
3) Adjusted interval widths were used with the half-normal model with cosine adjustments.
4) The original intervals were used with the uniform model with cosine adjustments (i.e., the Fourier series model).
5) Adjusted intervals were used with the uniform model with cosine adjustments (i.e., the Fourier series model).

The Chi-square goodness of fit test will often indicate a significant lack-of-fit if the sample size is large. If there was no apparent lack-of-fit based on graphical procedures then data were subsampled with fewer observations than in the original set. A model was judged to be adequate if no significant lack-of-fit was detected with the reduced sample size.

The program DISTANCE can analyze a maximum of 2000 observations, but pooling resulted in greater than 2000 observations for Group 4 aspen, Group 6 aspen, Group 7 conifer and mixed, Group 8 aspen, conifer and mixed, Warbling Vireos aspen, and Vireos aspen and mixed (Appendix E). For these categories, a systematic sample was drawn beginning with the first observation such that the total number of observations was less than 2000. The average detection probability was estimated. A second systematic sample was drawn from the same data set, beginning with the second observation, and the average detection probability estimated again. The process was repeated until every observation was included in exactly one of the systematic samples. The simple mean of the estimated average detection probabilities was calculated and used as the average detection probability for the category.

Density by plot, unadjusted for visibility bias was estimated using the following formula:

$$\hat{D}_u = \frac{n \times a.c.s. \times 10,000}{(\pi \times r^2 \times k)} \quad (2)$$

where: $\hat{D}_u$ = estimated unadjusted density per ha.,

n = number of clusters of birds observed,
a.c.s = average cluster size for the species,
r = radius of the circular plot (measured in meters) equal to the 95th percentile of distances for that species and habitat type, and
k = sampling effort

and the multiplier 10,000 is used to convert the density/m^2 to density/ha.

Finally, the observed density in the circular plot of radius r was adjusted for visibility bias by dividing by p, the average detection probability,

$$\hat{D} = \frac{\hat{D}_u}{p} \quad (3)$$

For example, if the unadjusted density is $\hat{D}_u = 0.5$ birds/ha and p = 0.25

then the adjusted estimate of density is D = 0.5/(0.25)ha = 2.0/ha.

Density may be calculated at the habitat, plot or sampling point level with the same equation (3).

ESTIMATION OF DENSITY VARIANCE

In this analysis we treat the estimation of density, via average detection probability estimation, as an instrument for measuring density of birds, thereby allowing the variance of intermediate mathematical steps to remain confounded with the variance due to sampling. The variance of bird density reported is the simple variance of the estimated density per habitat type where the sampling unit is the plot.

IDENTIFICATION OF RARE SPECIES

There were 33 bird species whose average density rounded to 2 decimal places was 0.00 in at least 5 of the 6 treetype by region categories. These

birds were excluded from repeated measures analysis of variance (RMANOVA) and from inclusion in the study of habitat selection.

REPEATED MEASURES ANALYSIS OF VARIANCE

Repeated measures analysis of variance (RMANOVA) partitions the total sum of squared errors into portions due to individual effects, interactions, and error. In this case, the main effects were region, treetype, and year. The 2-way interactions were region by treetype, year by region, and year by treetype. The 3-way interaction was year by region by treetype. There were 2 sources of error: error due to plot, and error due to year. The experiment was classified as a repeated measures design because measurements were made on the same plots in all 3 years. Intuitively, measurements taken 3 times on a single plot may be correlated. This lack of independence is considered with this type of analysis (Engemen et al. 1985).

The estimate of density for each of the 3 years was used as the dependent variable. Region, treetype and an interaction term were used as factors. The repeated measures model is:

$$D_{ijkl}=\mu+\rho_j+\tau_k+(\rho*\tau)_{jk}+\psi_l+(\psi*\rho)_{jl}+(\psi*\tau)_{kl}+(\psi*\rho*\tau)_{jkl}+\epsilon_{(plot)ijk}+\epsilon_{(year)l} \quad (4)$$

where:

D_{ijkl} = the density of a species on the i^{th} plot, j^{th} region, k^{th} treetype and l^{th} year,

μ = the overall mean density for a species,

ρ = the region main effect,

τ = the treetype main effect,

$\rho*\tau$ = the region by treetype interaction,

ψ = the year effect,

$\psi*\rho$ = the year by region interaction,

$\psi*\tau$ = the year by treetype interaction,

$\psi*\rho*\tau$ = the year by region by treetype 3-way interaction,

$\epsilon_{(plot)}$ = the error due to plot,

$\epsilon_{(year)}$ = the error due to year.

Where the assumption of compound symmetry (a specific structure in the correlation matrix) of the variance-covariance matrix was not met, the numerator and denominator degrees of freedom in the mean square ratio were multiplied by the Huynh-Feldt epsilon (Huynh & Feldt 1976). This allows an approximate analysis (Miliken & Johnson 1984).

CLUSTER ANALYSIS

Cluster analysis may be used to group multivariate observations according to the similarity of the observations. For this cluster analysis, there were 18 multivariate observations: density in north aspen plots in 1987, density in north aspen plots in 1988, density in north aspen plots in 1989, density in north conifer plots in 1987, and so forth. Each multivariate observation had 84 values: one value for each of the bird species. Two multivariate observations are "similar" if the 84 values on the first multivariate observation are "close" to the 84 values on the second multivariate observation. Therefore, the structure of the avian community, measured by density of each of 84 bird species, is used to assess the similarity among the 6 habitat types over the 3 years.

The correlation of two observations was selected as a measure of similarity among the multivariate observations and a correlation matrix was calculated from the 18 vectors. SPSS/PC (Norusis 1990) was used for hierarchical, agglomerative clustering on the correlation matrix, using average linkage between groups.

HABITAT DATA PREPARATION FOR ESTIMATION OF RESOURCE SELECTION FUNCTIONS

There were 27 habitat variables (Mullen 1992). There were 14 variables collected at each sampling station in 1987 only. These variables were expected to remain stable over the 3-year sampling period because they were either overstory variables or a measure of the topography of the plot. Percent canopy cover, distance to nearest live tree, crown maximum and crown minimum were subsampled by taking measurements in each of the four cardinal directions. The mean and standard deviation of the mean was calculated for each of those. Aspect, while measured in degrees from north, is inherently a circular variable. For analysis, it was converted to a categorical variable with 8 categories.

Thirteen variables were collected all 3 years from transects. Four variables were categorical. New variables were defined for each category with its value being the percent of its occurrence over the transect. For example, Cover type at vertical level 0.0–0.3m (CTI) had 9 categories: 1) grass, 2) forb, 3) shrub or sapling, 4) tree, 5) dead or down, 6) air, 7) litter, 8) rock, and 9) bare ground. Nine new variables were created to represent the % of transect points that were in each category. Suppose that of 12 transect points at the 0.0–0.3m vertical distance, 0 points were grass, 2 points were forbs, 1 was shrub or sapling, 0 were trees, 3 were dead or down, 0 were air, 4 were litter, 1 was rock and 1 was bare ground. Then the 9 new variables and their values would be:

CT1G	0.000	CT1T	0.000	CT1L	0.334
CT1F	0.167	CT1D	0.250	CT1R	0.083
CT1S	0.083	CT1A	0.000	CT1B	0.083

For numeric fields, the mean of the transect points and standard deviation of the mean was calculated. The 6 most abundant habitat species/genera at each of the 3 vertical levels (Appendix F) were selected as possible variables for estimation of a habitat selection function. Their values represent the percent of transect points where they occurred.

The mean and standard deviation (SD) of the habitat variables by habitat type was calculated (Table 2, see Table 1 for explanation of acronyms used in Table 2). The mean and SD of the transformed habitat variables collected all 3 years by year and habitat type was computed (Table 3).

HABITAT VARIABLE SELECTION

When designing an experiment, a scientist must judge which variables are important to include in the analysis. Pearson's correlation coefficient and tolerance for detection of correlated variables were selected to assist in an objective selection of variables based on the data collected.

For use with logistic regression and estimation of habitat selection functions, the simple mean of the data collected all 3 years was calculated for each variable, including the variables that were the standard deviation (SD) of the variables.

Pearson correlation coefficients were calculated. For each pair of variables with a correlation > 0.7, one of the variables was eliminated, using the following criteria:

1) If one of the 2 variables was a SD and the other was not, the SD variable was eliminated.
2) If one of the 2 variables was one of the more abundant species in the 3 levels and the other was not, the least abundant of the two variables was eliminated.
3) If both variables were abundant species in the 3 vertical levels, the species common to more vertical levels was kept.
4) If one of the two variables was the number of hits of vegetation at a vertical level and the other was not, the number of hits variable was eliminated.
5) The less expensive variable to collect was kept.

The variable ELEV (elevation) was eliminated because it was not recorded for most of the plots. The variable NNW (aspect north-northwest) was not included because it is a linear combination of the first 7 aspect categories.

Multiple regression was run with an arbitrary dependent variable and the remaining habitat variables as independent variables for the sole purpose of obtaining regression diagnostics. The diagnostics include "tolerance":

$$Tol = 1-R_i^2 \quad (5)$$

where R_i is the multiple correlation coefficient when the i^{th} independent variable is predicted from the other independent variables. A small tolerance indicates that the i^{th} independent variable is almost a linear combination of one or more of the other independent variables. The variable with the lowest tolerance was deleted, and the regression re-run with the remaining variables. This was repeated until all tolerances were greater than 0.5.

HABITAT SELECTION FUNCTIONS

Logistic regression is used to model the probability that a sampling point will be selected for use by a bird species, given the values of habitat

variables known to be related to a species' use (Manly et al. 1989). The equation for the logistic model is:

$$p = \frac{e^{\beta_0 + (\sum_{i=1}^{k} \beta_i x_i)}}{1 + e^{\beta_0 + (\sum_{i=1}^{k} \beta_i x_i)}} \quad (6)$$

where:

X_i = the value of the i^{th} variable, i = 1,2,...,k,
P = the probability of use at a sampling point,
β_i = the regression coefficient for the i^{th} variable.

Habitat variables with significant coefficients in the logistic regression significantly influence the probability that habitat points will be used by a bird species. The response variable is dichotomous and indicates whether or not a sampling station was used. Ideally, the definition of use separates the sample into approximately equal numbers of "used" stations and stations that were "not used" (L.L. McDonald, pers. commun. 1992). We define a sampling station to be used by a particular species if: 1) there was at least one sighting of the species at the point every year, 2) if the magnitude of use meets a certain level (e.g., a plot may be defined to be used if at least two sightings of the species at the point were made every year).

Selection of terms for a habitat selection model takes much time and careful thought. It is not possible to create useful models for numerous bird species in a batch processing mode. Time constraints dictated the decision to select 3 representative bird species and model the probability of use of a point as a function of the habitat variables. The methods, results and discussion of the habitat selection function for these 3 species may be used to develop a habitat selection function for any of the other species of interest during future analyses. The 3 species were selected because they were abundant, and because their results in the RMANOVA analysis illustrated the wide range of results possible for all the bird species included in the study. The 3 species selected were Brown-headed Cowbird, Hermit Thrush, and Western Wood-pewee (Table 4).

The LOGISTIC REGRESSION program in SPSS/PC+ (Norusis 1990) with forward stepwise option and criterion for removal based on change in log likelihood

ratio was used to select variables and estimate regression coefficients for the 3 bird species. A separate equation was fitted for each treetype in each region.

Because aspect was a categorical variable, if any one of the categories was chosen for the model, the logistic procedure was re-run for that species and habitat type with 1) all the aspect categories included, along with any other variables the procedure had chosen, and 2) none of the aspect categories included. The difference of the 2 log likelihood statistics was compared to a chi-square distribution with degrees of freedom equal to the difference in degrees of freedom for the 2 models. If significant, the model with the aspect categories was accepted.

RESULTS

DENSITY ESTIMATES AND REPEATED MEASURES ANALYSIS OF VARIANCE

Estimates of bird density for each habitat type by year were completed for 84 species (Table 5).

On the LSMEANS tables, main effects and interactions with significance level P at $P \leq .01$ were marked with 2 asterisks, those significant with P in the interval $[.01 < P \leq .05]$ were marked with a single asterisk. For interpretation we examine one species at a time. Results for Brown-headed Cowbird, Hermit Thrush, Western Wood-pewee, and American Robin are presented verbally in this section (Tables 6, 7, 16, 17, 42, 43, 90 & 91, Figs. 1, 6, 19 & 43), as illustrations of results from the RMANOVA tables, least squares means tables and graphs of least squares means that have been prepared for each of the 50 most abundant species (Tables 6-105, Figs. 1-50). These 4 bird species were selected because their results illustrate the wide range of possible results for the entire data set.

Estimated densities of Brown-headed Cowbird were significantly different only across treetypes ($p < 0.01$), with density in aspen plots the highest (0.70 birds/ha.), conifer plots the lowest (0.03 bird/ha.) and mixed plots density was intermediate (0.32 bird/ha.). Huynh-Feldt epsilon was 1.1775, indicating the assumption of compound symmetry of the variance-covariance matrix was satisfied. Therefore, numerator and denominator degrees of freedom for the F-

ratio were multiplied by one, so the Huynh-Feldt adjusted F was identical to the unadjusted F.

Hermit Thrush estimated densities were significantly different across regions (north plots = 0.14 bird/ha., south plots = 0.29 birds/ha., $p<0.01$) and across treetypes (aspen plots= 0.14 birds/ha., conifer plots= 0.29 birds/ha., mixed plots= 0.21 bird/ha., $p<0.01$). The Huynh-Feldt epsilon was 0.7511, indicating some departure from compound symmetry. The F-ratio degrees of freedom were adjusted and the Huynh-Feldt adjusted test is a more conservative test than the unadjusted F.

Western Wood-pewee, on the other hand, had significantly different estimated densities across years ($p=0.01$), ranging from 0.29 birds/ha. in 1987 to 0.53 birds/ha. in 1989. Huynh-Feldt epsilon (1.0221) indicated compound symmetry assumption was met.

American Robin had a significant ($p=0.02$) 3-way interaction between years, regions and treetypes (Fig. 1a). Estimated densities in north aspen and north mixed plots decreased in 1988 but increased in 1989. Estimated densities in south aspen and south mixed plots increased in 1988 and decreased in 1989. Estimated densities in south conifer plots increased both years, and estimated densities in north conifer plots decreased slightly in 1989. Huynh-Feldt epsilon (1.1131) indicated the compound symmetry assumption was met.

CLUSTER ANALYSIS

The habitat type-year combinations separated into 3 clusters of combinations that are similar, based on the estimated density of the 84 bird species (Fig. 51). One cluster is the north and south aspen habitats for all 3 years, the second is the south mixed habitats for all years plus the north mixed habitats for 1987 and 1989, and the third is all the conifer habitat type-years plus the one remaining north mixed habitat. The aspen cluster divides into southern and northern habitats. The first 5 habitat type-year variables to combine were aspen types.

A scree diagram (Fig. 52) indicated the largest resistance to amalgamation was when the aspen cluster was joined to the conifer/mixed cluster, thus suggesting a two cluster solution where conifer and mixed plots

are joined. There were 16 avian species that occurred only in aspen forests, 1 species occurred only in conifer, and 2 species that occurred only in mixed (Table 106).

HABITAT SELECTION FUNCTIONS

Thirty habitat variables remained after the variable selection process (indicated with asterisks on Tables 2 & 3). Habitat selection functions were fit within 4 habitat types for Western Wood-pewee, 5 habitat types for Hermit Thrush and 2 habitat types for Brown-headed Cowbird (Tables 107-109). Convergence was not achieved and models were not obtained for Western Wood-pewee north conifer, Brown-headed Cowbird north mixed, south conifer or south mixed. No habitat variables were significantly related to use for Western Wood-pewee south mixed, Hermit Thrush south mixed and Brown-headed Cowbird north conifer. In general and for interpretational purposes, if a parameter within the model is negative the probability of use by the particular bird increases as that parameter decreases. Conversely, if a parameter is positive, use by a bird increases as that parameter increases.

For Brown-headed Cowbird in the north aspen plots, the model included CT1D, SP1CARE, SP2LIPO and SP3POTR (see Table 1 for definitions of codes) as negative parameters (-13,67, -10.42, -12.15, and -22.02, respectively), and CT3G and SP3AMAL as positive parameters (56.61 and 14.46). As CT1D, SP1CARE, SP2LIPO and SP3POTR decrease, and CT3G and SP3AMAL increase, the probability of use by Brown-headed Cowbird increases. In the south aspen plots, SP2PTAQ was included in the model as a negative parameter (-8.98) and SP3SYOR was included as a positive parameter (29.99), indicating that the presence of SP3SYOR and lack of SP2PTAQ increases probability of use.

The model for Hermit Thrush in north aspen plots has 2 positive parameters, SP3SYOR and CT2T, at 71.05 and 50.32. This indicates that if the dominant species at the 1-2m vertical level is SYOR and the dominant cover type at the 0.3-1m vertical level is trees in north aspen plots, then use by Hermit Thrush increases. In the north conifer plots, only a negative parameter, CT1S, (-6.55) was obtained indicating that if the dominant cover type at the 0.0-0.3m vertical level is shrubs in north conifer plots, use by Hermit Thrush decreases. For north mixed plots, SP3POTR (-70.03) and SP1ELYM (-49.71) were significant negative parameters. For south aspen plots, the

single parameter, CT3D (−89.82), was negative. In the south conifer plots, both parameters were positive (SP2OSOC at 88.46 and SP2AGRO at 55.04).

The north aspen plots model for Western Wood−pewee had one negative and one positive parameter, SP1CARE (−8.67) and SP1ELYM (13.77). The north mixed plots for this species was the only model that included the aspect variable (NW = 0.36, SW = −4.96, SSW = 36.45, SSE = 22.25, NOE = −8.78 and NNE = −7.08). In addition, it included SP2ELYM (323.64) and CT1S (−419.09). The south aspen plots model includes CT1S (−12.61), CT1R (−58.73) and SP1CARE (12.25). The habitat selection function for Western Wood−pewee south conifer plots had only one parameter, SP3POTR (55.69), and is graphed (Fig. 53) as a function of % transect points with SP3POTR.

DISCUSSION OF STATISTICAL METHODOLOGY

REPEATED MEASURES ANALYSIS OF VARIANCE

Consider the graph of estimated densities by habitat type for each year for American Robin (Fig 1a) where the order used for plotting the least squares means is arbitrary. If the points for north conifer and north mixed were reversed, a line drawn between the points indicates that density of American Robins decreases as one moves from aspen to mixed to conifer habitats for all 3 years in the north. On the other hand, in the south, the mixed treetypes have the highest estimated densities, and estimated densities decrease in the other 2 treetypes. This explains the significance of the region by treetype interaction ($P < 0.01$). When averaged over region (Fig 1b), estimated densities across years remain fairly stable ($P = 0.43$). When averaged over treetype (Fig 1c), it is evident that estimated densities in the south increased, but estimated densities in the north decreased ($P < 0.01$). 1988 may have had a long winter or heavy snowfall resulting in a late spring. The results seen may then be interpreted as American Robins selecting nesting sites further south than usual, or Robins in the north delaying reproduction.

Many birds had significant differences in density across years. Several interpretations may be plausible. A weak recruitment from the previous year, weather, and/or observer bias may be responsible for many of these differences. Weather data is available but was not included with this analysis. Where differences existed across regions, regional weather patterns

or other regional characteristics could be examined with grouped species as above to investigate this explanation.

CLUSTER ANALYSIS

While many species were found in 2 or more of the 3 tree types, the community of birds, quantified by estimated bird densities, varied among the habitats. There were 16 species that occurred only in aspen forests, but only 3 species that occurred solely in mixed or conifer. Aspen forests were the most distinct. Years were not important in distinguishing clusters. These results support the position that there is an avian community particular to aspen forests. Loss of aspen habitats could lead to the loss of this avian guild and thus regional diversity in the avian community.

HABITAT SELECTION FUNCTIONS

The variables selected for a habitat selection function model are not necessarily variables that are important to the species. Instead, they may simply be indicators or descriptors of the habitat selected by the species, or indicators of variables that limit magnitude of use by the species. For an example we will examine the five habitat selection models for Hermit Thrushes.

Prior to any interpretation we have a predetermined idea of the biology of Hermit Thrushes. We know that they tend to be found in open coniferous forests or mixed woodlands. They typically nest on the ground and forage in the leaf litter of forest floors. The model for Hermit Thrush in north conifer plots had only one negative parameter, CT1S (cover type at the 0–0.3 meter level shrubs). We can interpret this to mean that increasing shrub cover in north coniferous plots has a decreasing effect on the density of Hermit Thrushes. This interpretation agrees with our knowledge of Hermit Thrush biology. In south aspen plots, we find that dead trees in the 1 – 2 meters level (CT3D) negatively affect density of Hermit Thrushes. Again this is accepted as we know Hermit Thrushes prefer shady forest floors for nesting and foraging. Dead trees may affect the density of the canopy resulting in a more open overstory. Additionally, in north mixed plots we find that SP3POTR (species Populus tremuloides at the 1 – 2 meter level) and SP1ELYM (species Elymus sp. as the ground cover, 0 – 0.3 meters) negatively affect the density of Hermit Thrushes. This also holds with our knowledge of Hermit Thrush biology, as we believe they prefer coniferous forests with an open understory

over deciduous woodland. However, in the south conifer plots we find that SP2OSOC and SP2AGRO have a positive affect on Hermit Thrush density. These parameters are both grassy understory plants. These plants may not be important to Hermit Thrushes but they may indicate a woodland with an open understory free of dense shrubby vegetation. This interpretation in turn does agree with our knowledge of Hermit Thrushes. Finally, in north aspen plots we find that SP3SYOR (species Symphoricarpos oreophilus at the 1 – 2 meter level; a member of the honeysuckle family) and CT2T (cover type trees at the 0.3 – 1 meter level) positively affect Hermit Thrush density. This model appears to describe sampling points that are dense in shrubby cover. We would expect that this type of sampling point would be unattractive to Hermit Thrushes based on our knowledge. In this case we may be able to interpret the results in an indirect fashion. That is, the presence of these factors in north aspen plots results in the lack of other factors that negatively affect Hermit Thrush density and therefore their positive affects on Hermit Thrush density. By examining each model in this fashion we are able to interpret and draw conclusions reagarding the densities of the avian species.

Variable selection was done "automatically" by the computer routines, and it is therefore doubtful that the "best" variables are in the model. A good model makes intuitive sense, is interpretable biologically, and uses variables that can be collected in future studies where use will be predicted. In addition, for some species, such as the Brown-headed Cowbird, densities of other bird species may be important variables. A fair test of a model is to split the data, build the model from one portion, and use the model to predict use on the other portion. Bird species that occur at most sampling points in a habitat type should be analyzed with linear regression, using magnitude of use as the dependent variable.

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Table 1. Habitat variables with acronyms observed during the avian response to habitat study in the Central Rocky Mountains, 1987-89.

Overstory and topographic variables collected during 1987 only:

ASPECT	Aspect
SLOPE	Slope
CC	% canopy cover
ELEV	Elevation
DLT	Distance to nearest live tree
CMAX	Crown maximum
CMIN	Crown minimum
CVAR	Crown variance (crown max - crown min) / (crown max)
BAA	Basal area - aspen
BASF	Basal area - subalpine fir
BAES	Basal area - Engelmann spruce
BALP	Basal area - lodgepole pine
BAOTHER	Basal area - other
SPOTHER	Species of "other"

Variables collected all three years along transects:

CT	Crown type. Choices were D) deciduous C) conifer M) mixed or O) other.
VFD1	Vertical foliage density I - the number of times vegetation touched a vertical rod between 0.0 and 0.3m.
CT1	Cover type I - category of dominant cover type at 0.0 to 0.3m. Choices were G) grass F) forbs S) shrub or sapling T) tree D) dead or down A) air L) litter R) rock B) bare ground.
SP1	Species I - the dominant species that intersected the vertical rod at 0.0 to 0.3m.
VFD2	Vertical foliage density II - the number of times vegetation touched a vertical rod between 0.3 and 1.0m.
CT2	Cover type II - category of dominant cover type at 0.3 to 1.0m. Choices were G) grass F) forbs S) shrub or sapling T) tree D) dead or down A) air.
SP2	Species II - the dominant species that intersected the vertical rod at 0.3 to 1.0m.
VFD3	Vertical foliage density III - the number of times vegetation touched a vertical rod between 1.0 and 2.0m.
CT3	Cover type III - category of dominant cover type at 1.0 to 2.0m. Choices were G) grass F) forbs S) shrub or sapling T) tree D) dead or down A) air.
SP3	Species III - the dominant species that intersected the vertical rod at 1.0 to 2.0m.
VFD4	Vertical foliage density IV - the number of times vegetation touched a vertical rod between 2.0 and 3.0m.
VFD5	Vertical foliage density V - the number of times vegetation touched a vertical rod between 3.0 and 4.0m.
LITTER	Depth of litter.

Table 2. Mean and standard deviation (sd) of habitat variables collected 1987 only, and the percent occurrences of each of the 8 aspect categories.

VARIABLE		North Aspen	North Conifer	North Mixed	South Aspen	South Conifer	South Mixed
SLOPE	mean	17.71	17.49	8.07	20.71	19.40	16.57
	sd	12.40	6.90	6.39	10.55	15.69	8.27
CC	mean	58.18	56.99	64.09	6.68	9.08	14.14
	sd	17.54	13.05	18.34	11.39	11.46	20.82
DLT	mean	2.29	2.35	2.15	2.55	2.02	2.93
	sd	1.94	1.92	1.44	3.34	1.20	3.84
CMAX	mean	49.10	57.01	47.62	56.81	59.41	57.10
	sd	16.30	16.09	10.43	13.01	11.58	14.93
CMIN	mean	28.47	11.59	22.53	37.44	16.65	26.94
	sd	12.06	6.00	10.49	11.49	9.90	13.78
CVAR	mean	0.43	0.80	0.54	0.35	0.72	0.54
	sd	0.10	0.09	0.16	0.12	0.15	0.19
BAA	mean	113.00	0.00	72.44	122.84	10.47	90.93
	sd	53.37	0.00	56.59	58.43	22.75	70.84
BASF	mean	0.78	65.11	2.33	0.26	65.81	25.27
	sd	4.93	48.79	6.37	3.26	55.82	27.22
BAES*	mean	0.00	69.89	0.00	0.07	71.86	10.44
	sd	0.00	45.11	0.00	0.86	45.77	26.45
BALP*	mean	0.04	9.56	57.67	0.00	0.00	0.00
	sd	0.61	21.92	48.06	0.00	0.00	0.00
BAOTHER*	mean	0.00	0.00	0.56	0.00	0.00	0.55
	sd	0.00	0.00	4.33	0.00	0.00	5.24
ASPECT*: NNE	%	24.1	17.8	26.7	21.7	35.2	20.9
NE	%	18.5	1.1	12.2	14.7	17.0	15.4
SE	%	8.1	0.0	4.4	6.6	3.4	1.1
SSE	%	4.4	0.0	4.4	4.0	3.4	1.1
SSW	%	3.0	4.4	11.1	9.2	3.4	1.1
SW	%	5.2	0.0	4.4	9.2	0.0	0.0
NW	%	9.3	13.3	11.1	18.8	2.3	18.7
NNW	%	24.1	57.8	20.0	14.7	33.0	41.8

Table 3. Means and standard deviations (SD) of transformed habitat variables measured all three years in the avian response to habitat study in the Central Rocky Mountains, 1987-89.

VARIABLE		North Aspen	North Conifer	North Mixed	South Aspen	South Conifer	South Mixed
CTD %	1987	98	0	3	95	0	58
	1988	97	0	2	90	0	40
	1989	96	0	3	96	0	28
	Mean	97.0	0.0	2.7	93.7	0.0	42.0
CTC %	1987	0	98	0	0	98	1
	1988	0	95	0	1	78	2
	1989	0	97	1	0	98	0
	Mean	0.0	96.7	0.3	0.3	91.3	1.0
CTM %	1987	1	0	96	0	0	29
	1988	3	0	97	0	7	47
	1989	4	0	93	0	0	63
	Mean	2.7	0.0	95.3	0.0	2.3	46.3
CTO %	1987	1	2	1	5	2	11
	1988	1	5	2	9	16	10
	1989	0	3	3	4	2	9
	Mean	0.7	3.3	2.0	6.0	6.7	10.0
VFD1	Mean 1987	2.44	1.88	1.84	4.01	2.44	3.40
	SD	0.90	0.63	0.84	1.42	1.09	1.47
	Mean 1988	3.82	2.24	2.76	1.80	1.10	1.22
	SD	1.48	0.97	1.77	0.85	0.57	0.59
	Mean 1989	2.39	1.69	2.51	2.03	1.70	1.16
	SD	0.92	0.65	1.18	0.94	0.77	0.63
	Mean 1987-89	2.80	1.92	2.28	2.88	1.91	2.28
	SD	1.26	0.76	1.33	1.57	1.06	1.57
CT1G	Mean 1987	.39	.07	.47	.18	.10	.13
	SD	.17	.10	.18	.16	.12	.12
	Mean 1988	.39	.06	.44	.18	.10	.11
	SD	.19	.11	.19	.15	.11	.11
	Mean 1989	.29	.07	.43	.17	.13	.12
	SD	.17	.09	.19	.15	.12	.13
	Mean 1987-89	.37	.07	.45	.18	.11	.12
	SD	.18	.10	.18	.15	.12	.12

CT1F	Mean 1987	.39	.26	.23	.65	.48	.60
	SD	.17	.23	.15	.18	.20	.17
	Mean 1988	.43	.50	.24	.47	.27	.43
	SD	.20	.20	.17	.17	.19	.20
	Mean 1989	.53	.26	.32	.53	.29	.39
	SD	.18	.21	.14	.19	.18	.16
	Mean 1987-89	.43	.32	.25	.56	.38	.50
	SD	.19	.24	.16	.20	.22	.20
CT1S*	Mean 1987	.05	.31	.01	.03	.04	.03
	SD	.07	.25	.03	.06	.06	.06
	Mean 1988	.04	.02	.01	.02	.09	.01
	SD	.06	.04	.03	.04	.14	.03
	Mean 1989	.05	.36	.01	.03	.05	.04
	SD	.06	.24	.03	.06	.08	.05
	Mean 1987-89	.05	.25	.01	.03	.05	.03
	SD	.07	.25	.03	.05	.09	.05
CT1T*	Mean 1987	.00	.00	.01	.01	.02	.02
	SD	.01	.01	.02	.03	.04	.04
	Mean 1988	.00	.01	.01	.01	.01	.00
	SD	.01	.03	.03	.03	.02	.02
	Mean 1989	.00	.01	.01	.00	.01	.01
	SD	.02	.02	.02	.02	.03	.02
	Mean 1987-89	.00	.01	.01	.01	.01	.01
	SD	.01	.02	.02	.02	.04	.03
CT1D*	Mean 1987	.01	.04	.01	.01	.05	.03
	SD	.03	.06	.03	.03	.08	.07
	Mean 1988	.04	.10	.03	.00	.01	.02
	SD	.08	.13	.05	.01	.04	.04
	Mean 1989	.03	.06	.01	.01	.06	.02
	SD	.05	.08	.03	.03	.09	.06
	Mean 1987-89	.02	.06	.02	.01	.04	.03
	SD	.05	.09	.04	.02	.08	.06
CT1A	Mean 1987	.00	.00	.00	.08	.28	.14
	SD	.02	.02	.01	.13	.19	.16
	Mean 1988	.01	.01	.06	.21	.39	.34
	SD	.03	.05	.14	.15	.21	.21
	Mean 1989	.09	.23	.21	.18	.27	.38
	SD	.10	.18	.16	.17	.20	.19
	Mean 1987-89	.03	.06	.07	.15	.31	.25
	SD	.07	.14	.14	.16	.21	.21

CT1L*	Mean 1987	.15	.25	.27	.04	.02	.05
	SD	.12	.16	.16	.07	.04	.07
	Mean 1988	.02	.04	.04	.09	.08	.05
	SD	.05	.06	.09	.09	.09	.07
	Mean 1989	.00	.00	.00	.07	.08	.04
	SD	.00	.00	.00	.09	.08	.07
	Mean 1987-89	.08	.14	.13	.06	.05	.05
	SD	.11	.16	.17	.08	.07	.07
CT1R*	Mean 1987	.00	.01	.00	.00	.01	.00
	SD	.00	.03	.01	.04	.05	.01
	Mean 1988	.00	.00	.00	.00	.02	.00
	SD	.00	.00	.00	.00	.07	.00
	Mean 1989	.00	.00	.00	.00	.00	.00
	SD	.00	.02	.00	.01	.02	.00
	Mean 1987-89	.00	.00	.00	.00	.01	.00
	SD	.00	.02	.00	.03	.05	.01
CT1B	Mean 1987	.01	.01	.00	.00	.00	.00
	SD	.03	.03	.01	.01	.00	.00
	Mean 1988	.07	.25	.18	.01	.00	.03
	SD	.11	.19	.20	.05	.01	.06
	Mean 1989	.01	.00	.01	.00	.00	.00
	SD	.03	.02	.05	.00	.00	.00
	Mean 1987-89	.03	.07	.06	.00	.00	.01
	SD	.07	.14	.14	.03	.01	.03
SP1CARE*	Mean 1987	.03	.02	.09	.02	.01	.04
	SD	.06	.06	.10	.07	.04	.07
	Mean 1988	.21	.04	.33	.08	.04	.03
	SD	.13	.09	.23	.11	.09	.06
	Mean 1989	.06	.03	.11	.07	.09	.06
	SD	.11	.07	.17	.10	.12	.11
	Mean 1987-89	.09	.03	.17	.05	.04	.04
	SD	.13	.07	.19	.09	.09	.08
SP1OSOC	Mean 1987	.01	.00	.00	.09	.03	.08
	SD	.03	.00	.02	.09	.06	.10
	Mean 1988	.08	.01	.02	.07	.01	.06
	SD	.10	.02	.06	.08	.02	.09
	Mean 1989	.07	.00	.03	.09	.01	.02
	SD	.08	.02	.05	.11	.03	.05
	Mean 1987-89	.04	.00	.01	.08	.02	.06
	SD	.08	.01	.04	.09	.05	.09

Final Report - Table 3 (cont)

SP1POAS*	Mean 1987	.15	.01	.03	.00	.00	.00
	SD	.17	.03	.06	.00	.00	.00
	Mean 1988	.01	.01	.00	.01	.00	.00
	SD	.05	.02	.01	.03	.01	.01
	Mean 1989	.11	.01	.00	.03	.01	.01
	SD	.17	.04	.01	.08	.02	.03
	Mean 1987-89	.10	.01	.01	.01	.00	.00
	SD	.16	.03	.04	.04	.01	.02
SP1AGRO	Mean 1987	.00	.01	.00	.11	.03	.10
	SD	.01	.04	.01	.12	.06	.10
	Mean 1988	.00	.00	.01	.09	.02	.06
	SD	.00	.00	.09	.10	.04	.09
	Mean 1989	.00	.00	.00	.05	.01	.04
	SD	.01	.00	.00	.07	.04	.06
	Mean 1987-89	.00	.01	.01	.09	.02	.07
	SD	.01	.03	.05	.11	.05	.09
SP1CARU*	Mean 1987	.06	.00	.27	.00	.00	.00
	SD	.11	.00	.20	.00	.00	.00
	Mean 1988	.00	.00	.00	.00	.00	.00
	SD	.00	.00	.00	.00	.00	.01
	Mean 1989	.03	.00	.26	.00	.00	.00
	SD	.07	.02	.23	.00	.00	.00
	Mean 1987-89	.04	.00	.18	.00	.00	.00
	SD	.09	.01	.22	.00	.00	.01
SP1ELYM*	Mean 1987	.09	.01	.00	.00	.00	.00
	SD	.10	.03	.02	.00	.00	.00
	Mean 1988	.12	.00	.02	.00	.00	.00
	SD	.12	.00	.06	.00	.00	.00
	Mean 1989	.05	.01	.00	.00	.00	.00
	SD	.07	.04	.01	.00	.00	.00
	Mean 1987-89	.09	.01	.01	.00	.00	.00
	SD	.10	.03	.04	.00	.00	.00
VFD2	Mean 1987	1.23	.28	.26	4.32	.72	2.65
	SD	.66	.31	.44	2.08	.88	1.87
	Mean 1988	1.15	.42	.24	1.48	.23	.77
	SD	.84	.53	.28	.81	.33	.47
	Mean 1989	1.07	.41	.39	1.78	.40	.91
	SD	.68	.53	.41	.81	.39	.77
	Mean 1987-89	1.17	.35	.29	2.87	.51	1.73
	SD	.72	.43	.39	2.05	.70	1.66

CT2G	Mean 1987	.26	.02	.08	.12	.02	.09
	SD	.16	.06	.13	.11	.07	.11
	Mean 1988	.14	.01	.03	.07	.01	.04
	SD	.13	.04	.05	.08	.03	.07
	Mean 1989	.15	.02	.08	.09	.01	.04
	SD	.14	.06	.10	.12	.04	.06
	Mean 1987-89	.20	.02	.07	.10	.02	.06
	SD	.16	.06	.11	.11	.05	.09
CT2F	Mean 1987	.19	.05	.03	.59	.11	.37
	SD	.13	.09	.09	.21	.14	.23
	Mean 1988	.19	.04	.02	.47	.05	.31
	SD	.14	.08	.04	.22	.08	.23
	Mean 1989	.21	.03	.04	.48	.06	.26
	SD	.16	.08	.07	.20	.09	.21
	Mean 1987-89	.19	.04	.03	.53	.09	.32
	SD	.14	.08	.07	.22	.12	.23
CT2S	Mean 1987	.10	.04	.03	.09	.04	.05
	SD	.12	.07	.05	.10	.07	.07
	Mean 1988	.12	.05	.02	.08	.04	.04
	SD	.13	.07	.05	.10	.06	.07
	Mean 1989	.13	.08	.05	.11	.06	.07
	SD	.14	.13	.08	.12	.08	.08
	Mean 1987-89	.11	.05	.03	.09	.04	.05
	SD	.13	.09	.06	.11	.07	.07
CT2T*	Mean 1987	.00	.01	.02	.01	.03	.05
	SD	.02	.03	.05	.03	.05	.07
	Mean 1988	.00	.01	.02	.01	.02	.05
	SD	.02	.03	.05	.03	.04	.07
	Mean 1989	.01	.02	.01	.01	.02	.04
	SD	.02	.04	.03	.03	.04	.06
	Mean 1987-89	.00	.01	.02	.01	.03	.05
	SD	.02	.03	.04	.03	.05	.07
CT2D*	Mean 1987	.00	.02	.01	.00	.01	.01
	SD	.01	.04	.02	.01	.04	.02
	Mean 1988	.01	.02	.00	.00	.00	.01
	SD	.03	.05	.02	.01	.01	.03
	Mean 1989	.01	.04	.01	.00	.04	.01
	SD	.03	.06	.03	.01	.07	.05
	Mean 1987-89	.01	.02	.01	.00	.02	.01
	SD	.02	.05	.02	.01	.05	.03

CT2A	Mean 1987	.45	.84	.83	.19	.77	.43
	SD	.19	.17	.16	.17	.20	.24
	Mean 1988	.54	.87	.90	.36	.87	.55
	SD	.21	.14	.08	.21	.11	.21
	Mean 1989	.50	.81	.80	.31	.80	.57
	SD	.24	.18	.15	.18	.15	.20
	Mean 1987-89	.44	.84	.84	.27	.81	.50
	SD	.21	.17	.14	.20	.17	.23
	Mean 1987-89						
	SD						
SP2SYOR*	Mean 1987	.05	.00	.00	.07	.00	.03
	SD	.08	.00	.01	.09	.00	.06
	Mean 1988	.07	.00	.00	.06	.00	.04
	SD	.11	.00	.02	.09	.00	.07
	Mean 1989	.07	.00	.01	.07	.00	.03
	SD	.10	.00	.02	.10	.00	.05
	Mean 1987-89	.06	.00	.00	.07	.00	.03
	SD	.09	.00	.01	.09	.00	.06
SP2LIPO*	Mean 1987	.04	.01	.00	.05	.01	.04
	SD	.08	.03	.00	.09	.04	.07
	Mean 1988	.05	.00	.00	.06	.01	.06
	SD	.08	.02	.00	.09	.05	.09
	Mean 1989	.06	.00	.00	.06	.02	.06
	SD	.10	.00	.01	.10	.03	.08
	Mean 1987-89	.05	.01	.00	.06	.02	.05
	SD	.08	.03	.00	.09	.04	.08
SP2ELYM*	Mean 1987	.14	.00	.02	.00	.00	.00
	SD	.12	.01	.07	.00	.00	.00
	Mean 1988	.09	.00	.01	.00	.00	.00
	SD	.11	.01	.02	.00	.00	.00
	Mean 1989	.10	.01	.01	.00	.00	.00
	SD	.10	.04	.03	.00	.00	.00
	Mean 1987-89	.12	.00	.01	.00	.00	.00
	SD	.12	.02	.05	.00	.00	.00
SP2OSOC*	Mean 1987	.01	.00	.00	.08	.01	.03
	SD	.04	.00	.01	.09	.02	.05
	Mean 1988	.03	.00	.00	.06	.00	.02
	SD	.06	.01	.02	.07	.00	.05
	Mean 1989	.02	.00	.01	.07	.00	.01
	SD	.05	.00	.02	.08	.01	.03
	Mean 1987-89	.02	.00	.00	.07	.00	.02
	SD	.05	.01	.02	.08	.02	.05

SP2AGRO*	Mean 1987	.00	.01	.00	.11	.02	.08
	SD	.01	.03	.01	.11	.06	.10
	Mean 1988	.00	.00	.00	.05	.01	.04
	SD	.00	.00	.00	.07	.02	.07
	Mean 1989	.00	.00	.00	.05	.01	.04
	SD	.01	.00	.00	.09	.04	.05
	Mean 1987-89	.00	.00	.00	.08	.01	.06
	SD	.01	.02	.00	.10	.05	.09
SP2PTAQ*	Mean 1987	.00	.00	.00	.05	.00	.06
	SD	.00	.00	.00	.13	.00	.15
	Mean 1988	.00	.00	.00	.04	.00	.06
	SD	.00	.00	.00	.09	.00	.12
	Mean 1989	.00	.00	.00	.05	.00	.05
	SD	.00	.00	.00	.12	.00	.12
	Mean 1987-89	.00	.00	.00	.05	.00	.06
	SD	.00	.00	.00	.11	.00	.13
VFD3	Mean 1987	.17	.20	.19	.43	.29	.62
	SD	.25	.31	.24	.53	.43	.89
	Mean 1988	.16	.44	.33	.12	.11	.21
	SD	.25	.87	.46	.16	.16	.27
	Mean 1989	.20	.26	.36	.14	.22	.31
	SD	.32	.44	.54	.20	.39	.33
	Mean 1987-89	.18	.27	.27	.27	.23	.44
	SD	.27	.54	.40	.41	.37	.68
CT3G*	Mean 1987	.02	.00	.00	.02	.00	.01
	SD	.05	.00	.00	.04	.00	.03
	Mean 1988	.00	.00	.00	.00	.00	.00
	SD	.01	.00	.00	.01	.00	.00
	Mean 1989	.01	.00	.00	.00	.00	.00
	SD	.02	.00	.00	.01	.00	.00
	Mean 1987-89	.01	.00	.00	.01	.00	.00
	SD	.03	.00	.00	.03	.00	.02
CT3F*	Mean 1987	.01	.00	.00	.09	.00	.03
	SD	.04	.00	.00	.13	.02	.08
	Mean 1988	.01	.00	.00	.03	.00	.01
	SD	.03	.01	.00	.06	.01	.03
	Mean 1989	.00	.00	.00	.03	.00	.02
	SD	.02	.01	.00	.07	.00	.08
	Mean 1987-89	.01	.00	.00	.06	.00	.02
	SD	.03	.01	.00	.11	.01	.07

CT3S	Mean 1987	.07	.04	.04	.03	.01	.03
	SD	.11	.07	.07	.06	.03	.06
	Mean 1988	.06	.02	.03	.03	.01	.02
	SD	.10	.05	.05	.06	.04	.07
	Mean 1989	.06	.02	.03	.03	.02	.05
	SD	.10	.05	.05	.06	.06	.09
	Mean 1987-89	.06	.03	.03	.03	.01	.03
	SD	.11	.06	.06	.06	.04	.07
CT3T	Mean 1987	.01	.05	.08	.02	.06	.08
	SD	.04	.09	.10	.05	.09	.10
	Mean 1988	.01	.04	.06	.01	.04	.07
	SD	.04	.07	.08	.03	.06	.09
	Mean 1989	.02	.05	.04	.01	.06	.09
	SD	.05	.07	.07	.03	.12	.11
	Mean 1987-89	.01	.05	.06	.02	.05	.08
	SD	.04	.08	.09	.04	.09	.10
CT3D*	Mean 1987	.00	.01	.00	.00	.00	.00
	SD	.01	.02	.02	.01	.01	.02
	Mean 1988	.00	.00	.00	.00	.00	.01
	SD	.02	.02	.00	.01	.01	.03
	Mean 1989	.00	.01	.02	.00	.01	.01
	SD	.02	.02	.04	.01	.03	.02
	Mean 1987-89	.00	.01	.01	.00	.00	.01
	SD	.02	.02	.02	.01	.02	.02
CT3A	Mean 1987	.90	.89	.88	.83	.92	.85
	SD	.13	.15	.13	.16	.11	.14
	Mean 1988	.92	.93	.91	.92	.95	.89
	SD	.11	.08	.08	.09	.07	.12
	Mean 1989	.90	.92	.91	.92	.90	.84
	SD	.12	.09	.09	.10	.15	.15
	Mean 1987-89	.90	.91	.90	.88	.92	.86
	SD	.12	.13	.11	.14	.11	.14
SP3ABLA*	Mean 1987	.00	.05	.04	.00	.06	.08
	SD	.03	.08	.07	.02	.10	.11
	Mean 1988	.00	.04	.03	.00	.04	.06
	SD	.01	.06	.07	.01	.06	.09
	Mean 1989	.01	.04	.01	.00	.06	.11
	SD	.03	.07	.05	.02	.15	.13
	Mean 1987-89	.00	.05	.03	.00	.05	.09
	SD	.03	.07	.07	.02	.10	.11

SP3AMAL*	Mean 1987	.03	.00	.00	.01	.00	.00
	SD	.08	.00	.00	.04	.00	.00
	Mean 1988	.03	.00	.00	.00	.00	.00
	SD	.07	.00	.00	.03	.00	.00
	Mean 1989	.04	.00	.00	.01	.00	.00
	SD	.08	.00	.00	.03	.00	.00
	Mean 1987-89	.03	.00	.00	.01	.00	.00
	SD	.08	.00	.00	.04	.00	.00
SP3POTR*	Mean 1987	.02	.00	.02	.02	.00	.01
	SD	.05	.00	.05	.04	.00	.02
	Mean 1988	.02	.00	.01	.02	.01	.01
	SD	.04	.00	.03	.04	.02	.02
	Mean 1989	.03	.00	.02	.01	.00	.00
	SD	.06	.00	.03	.03	.01	.01
	Mean 1987-89	.02	.00	.02	.02	.00	.01
	SD	.05	.00	.04	.04	.01	.02
SP3PICO*	Mean 1987	.00	.00	.06	.00	.00	.00
	SD	.00	.01	.10	.00	.00	.00
	Mean 1988	.00	.00	.04	.00	.00	.00
	SD	.00	.02	.06	.00	.00	.00
	Mean 1989	.00	.01	.06	.00	.00	.00
	SD	.00	.03	.08	.00	.00	.00
	Mean 1987-89	.00	.00	.06	.00	.00	.00
	SD	.00	.02	.09	.00	.00	.00
SP3SYOR*	Mean 1987	.00	.00	.00	.02	.00	.01
	SD	.01	.00	.00	.03	.00	.03
	Mean 1988	.00	.00	.00	.02	.00	.01
	SD	.02	.00	.00	.04	.00	.02
	Mean 1989	.00	.00	.00	.02	.00	.01
	SD	.02	.00	.00	.04	.00	.03
	Mean 1987-89	.00	.00	.00	.02	.00	.01
	SD	.02	.00	.00	.04	.00	.03
SP3PIEN*	Mean 1987	.00	.04	.00	.00	.02	.00
	SD	.01	.08	.00	.01	.05	.02
	Mean 1988	.00	.02	.00	.00	.01	.01
	SD	.02	.05	.00	.00	.03	.02
	Mean 1989	.00	.02	.00	.00	.03	.00
	SD	.00	.04	.00	.00	.06	.02
	Mean 1987-89	.00	.03	.00	.00	.02	.00
	SD	.01	.06	.00	.00	.05	.02

Final Report - Table 3 (cont)

VFD4	Mean 1987	1.48	2.81	2.31	1.52	6.43	4.38
	SD	1.19	1.97	1.13	1.81	4.66	4.52
	Mean 1988	2.26	8.56	4.46	1.22	3.93	1.91
	SD	2.12	4.75	4.45	1.10	2.73	1.36
	Mean 1989	2.10	.	3.91	.25	.08	.23
	SD	2.01	.	2.79	.77	.26	.29
	Mean 1987-89	1.78	4.70	3.28	1.27	5.02	3.00
	SD	1.66	4.15	3.07	1.55	4.37	3.81
VFD5	Mean 1987	2.52	2.70	2.88	3.88	7.85	4.16
	SD	1.53	2.02	1.75	2.57	9.21	3.53
	Mean 1988	2.03	4.25	2.48	1.57	2.43	1.33
	SD	1.80	5.18	2.51	1.02	2.06	1.15
	Mean 1989	4.66	.	8.56	.00	.00	.00
	SD	3.12	.	4.32	.00	.00	.00
	Mean 1987-89	2.50	3.20	3.69	2.65	5.39	2.68
	SD	1.87	3.45	3.38	2.43	7.77	3.19
LITTER	Mean 1987	1.52	2.16	1.93	3.08	3.96	3.31
	SD	.67	1.71	.63	1.77	3.21	2.92
	Mean 1988	3.01	2.40	3.12	2.54	2.41	1.98
	SD	1.46	1.22	1.61	1.49	2.14	1.04
	Mean 1989	2.73	3.86	2.59	2.10	2.45	1.74
	SD	1.23	3.12	1.13	1.00	1.85	1.68
	Mean 1987-89	2.22	2.65	2.45	2.69	3.18	2.57
	SD	1.28	2.18	1.23	1.58	2.76	2.39

Table 4. Definition of "use" and percent used for three species of birds used in habitat selection functions for avian response to habitat study in the Central Rocky Mountains, 1987-89.

BIRD	REGION	TREE-TYPE	DEFINITION OF USE	% USED
Brown-headed Cowbird	North	Aspen	At least one sighting on each of two years	60
		Conifer	At least one sighting over the three years	12
		Mixed	At least one sighting over the three years	80
	South	Aspen	At least one sighting on each of two years	63
		Conifer	At least one sighting over the three years	24
		Mixed	Three or more clusters sighted over three years	39
Hermit Thrush	North	Aspen	At least one sighting over the three years	61
		Conifer	Ten or more clusters sighted over three years	54
		Mixed	Three or more sightings each of the three years	53
	South	Aspen	Three or more sightings each of the three years	68
		Conifer	Three or more clusters sighted over three years	35
		Mixed	Three or more clusters sighted over three years	36
Western Wood-pewee	North	Aspen	Three or more clusters sighted over three years	49
		Conifer	At least one sighting over the three years	15
		Mixed	At least one sighting over the three years	10
	South	Aspen	Three or more clusters sighted over three years	59
		Conifer	At least one sighting over the three years	15
		Mixed	At least one sighting on each of two years	56

Table 5. Density (DEN) and standard deviation (SD) of density for 84 species of birds observed in the avian response to habitat study in the Central Rocky Mountains, 1987-89.

BIRD	REGION	TREETYPE	DEN87	SD87	DEN88	SD88	DEN89	SD89
ALFL	N	A	.00	.00	0.00	0.00	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	0.00	0.00	.00	.01
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00
AMCR	N	A	.00	.01	.01	.02	.03	.02
	N	C	0.00	0.00	0.00	0.00	.01	.01
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	.00	.00	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00
AMRO	N	A	2.01	1.33	1.47	.81	2.56	.99
	N	C	.65	.27	.65	.38	.41	.17
	N	M	1.86	.26	1.04	.31	1.32	.25
	S	A	1.18	.44	1.40	.79	.70	.39
	S	C	.67	.04	1.33	.77	1.41	1.02
	S	M	1.77	.34	2.44	1.01	1.95	.82
BBMA	N	A	0.00	0.00	0.00	0.00	.00	.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	.00	.00	0.00	0.00	.00	.01
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	.00	.00	0.00	0.00	0.00	0.00
BCCH	N	A	.52	.33	.44	.21	.53	.28
	N	C	0.00	0.00	.12	.14	.12	.11
	N	M	.17	.02	.38	.23	.12	.05
	S	A	.14	.12	.15	.17	.18	.18
	S	C	.04	.03	.08	.11	.12	.11
	S	M	.02	.01	.05	.02	.06	.03
BCHU	N	A	0.00	0.00	0.00	0.00	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	.10	.29	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00

Table 5 (cont). Density (DEN) and standard deviation (SD) of density for 84 species of birds observed in the avian response to habitat study in the Central Rocky Mountains, 1987-89.

BIRD	REGION	TREETYPE	DEN87	SD87	DEN88	SD88	DEN89	SD89
BGWA	N	A	0.00	0.00	0.00	0.00	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	.01	.01	0.00	0.00	0.00	0.00
BHCO	N	A	.90	.59	.94	.66	.57	.44
	N	C	0.00	0.00	.05	.03	,02	.01
	N	M	.57	.35	.15	.15	.20	.26
	S	A	.63	.38	.74	.43	.44	.44
	S	C	.04	.04	.02	.03	.03	.04
	S	M	.23	.04	.42	.20	.36	.21
BHGR	N	A	.02	.02	.06	.04	.11	.33
	N	C	0.00	0.00	.01	.02	.01	.01
	N	M	.01	.02	0.00	0.00	0.00	0.00
	S	A	.04	.03	.07	.07	.08	.08
	S	C	.02	.02	.04	.05	.04	.04
	S	M	.02	.01	.09	.10	.05	.01
BLBW	N	A	0.00	0.00	.00	.01	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00
BLSW	N	A	0.00	0.00	0.00	0.00	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	.00	.01	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00
BRBL	N	A	.01	.01	.05	.14	.02	.03
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	.00	.01	.01	.02	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00

Table 5 (cont). Density (DEN) and standard deviation (SD) of density for 84 species of birds observed in the avian response to habitat study in the Central Rocky Mountains, 1987-89.

BIRD	REGION	TREETYPE	DEN87	SD87	DEN88	SD88	DEN89	SD89
BRCR	N	A	.00	.01	.00	.00	.00	.01
	N	C	.52	.20	.39	.21	.11	.05
	N	M	.23	.10	.14	.11	.07	.02
	S	A	.01	.01	.00	.00	.01	.02
	S	C	.16	.20	.17	.09	.47	.23
	S	M	.05	.03	.08	.01	.06	.02
BTHU	N	A	3.90	1.98	3.27	2.11	3.41	2.84
	N	C	.24	.08	.13	.05	.18	.19
	N	M	.22	.10	.18	.21	.23	.13
	S	A	6.83	3.80	7.51	4.00	10.63	3.75
	S	C	.39	.33	.67	.44	.57	.47
CAFI	N	A	.16	.15	.11	.25	.13	.16
	N	C	.16	.07	.21	.03	.19	.11
	N	M	.08	.07	.08	.03	.08	.04
	S	A	.04	.05	.06	.11	.05	.11
	S	C	.02	.01	.02	0.00	.03	.03
	S	M	.02	.02	.03	.04	.03	.06
CHSP	N	A	.01	.01	.02	.02	.26	.42
	N	C	.04	.07	.03	.04	0.00	0.00
	N	M	.01	.01	.01	.01	.06	.09
	S	A	.00	.01	.01	.01	.02	.02
	S	C	.03	.03	0.00	0.00	0.00	0.00
	S	M	.04	.06	.01	.02	.03	.03
CLNU	N	A	0.00	0.00	0.00	0.00	0.00	0.00
	N	C	.14	.15	.05	.04	.08	.09
	N	M	.01	.02	.02	.03	0.00	0.00
	S	A	.00	.00	.00	.00	0.00	0.00
	S	C	.03	.06	.02	.02	.02	.03
	S	M	0.00	0.00	.01	.01	0.00	0.00
COGR	N	A	.00	.01	0.00	0.00	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00

Table 5 (cont). Density (DEN) and standard deviation (SD) of density for 84 species of birds observed in the avian response to habitat study in the Central Rocky Mountains, 1987-89.

BIRD	REGION	TREETYPE	DEN87	SD87	DEN88	SD88	DEN89	SD89
CORA	N	A	.00	.01	.00	.01	.00	.01
	N	C	.00	.01	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	.04	.04	.03	.04	.03	.03
	S	C	0.00	0.00	.01	.01	.03	.03
	S	M	.03	.01	.03	.04	.06	.05
DEJU	N	A	2.19	.71	1.09	.67	2.68	.93
	N	C	2.72	1.28	1.49	.19	2.28	.60
	N	M	3.50	.92	5.95	1.24	5.41	.90
	S	A	2.93	1.30	2.30	1.03	1.84	1.01
	S	C	2.15	1.28	1.19	.26	2.54	.46
	S	M	5.95	2.54	2.53	.63	2.77	.26
DOWO	N	A	.07	.04	.06	.08	.07	.05
	N	C	.01	.02	0.00	0.00	.01	.02
	N	M	.01	.01	0.00	0.00	0.00	0.00
	S	A	.03	.03	.01	.01	.03	.06
	S	C	.04	.05	.01	.01	0.00	0.00
	S	M	.00	.01	.02	.04	0.00	0.00
DUFL	N	A	.59	.36	.70	.40	.32	.29
	N	C	.18	.22	0.00	0.00	0.00	0.00
	N	M	.00	.00	.03	.02	0.00	0.00
	S	A	.13	.08	.29	.15	.32	.19
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	.04	.05	.04	.03	.08	.04
EMPI	N	A	0.00	0.00	0.00	0.00	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	.03	.04	0.00	0.00	0.00	0.00
	S	C	.06	.10	0.00	0.00	0.00	0.00
	S	M	.01	.01	0.00	0.00	0.00	0.00
EUST	N	A	0.00	0.00	0.00	0.00	.00	.01
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00

Table 5 (cont). Density (DEN) and standard deviation (SD) of density for 84 species of birds observed in the avian response to habitat study in the Central Rocky Mountains, 1987-89.

BIRD	REGION	TREETYPE	DEN87	SD87	DEN88	SD88	DEN89	SD89
EVGR	N	A	.22	.47	.10	.17	.04	.08
	N	C	.02	.01	.02	.03	.04	.04
	N	M	.01	.03	0.00	0.00	.09	.09
	S	A	.34	.33	.03	.06	.07	.11
	S	C	.25	.22	.19	.20	.15	.18
	S	M	1.04	1.43	.28	.23	.35	.51
FOSP	N	A	.00	.00	0.00	0.00	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	.01	.01	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00
GCKI	N	A	0.00	0.00	0.00	0.00	0.00	0.00
	N	C	1.03	.02	.56	.12	.48	.10
	N	M	.03	.02	0.00	0.00	0.00	0.00
	S	A	.01	.01	0.00	0.00	.00	.01
	S	C	1.18	.52	.73	.48	1.16	.12
	S	M	.28	.08	.11	.16	.21	.20
GRCA	N	A	.02	.03	.00	.01	0.00	0.00
	N	C	0.00	0.00	.01	.01	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00
GRJA	N	A	.00	.00	0.00	0.00	0.00	0.00
	N	C	.41	.29	.30	.20	.39	.17
	N	M	.06	.02	.10	.11	.05	.09
	S	A	.00	.00	.00	.00	.00	.01
	S	C	.30	.17	.39	.51	.58	.21
	S	M	.01	.01	.06	.10	.04	.04
GTTO	N	A	.02	.04	.01	.02	.01	.02
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	.01	.01
	S	A	.01	.01	.00	.01	.01	.01
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	.02	.03	.03	.05	.01	.02

Table 5 (cont). Density (DEN) and standard deviation (SD) of density for 84 species of birds observed in the avian response to habitat study in the Central Rocky Mountains, 1987-89.

BIRD	REGION	TREETYPE	DEN87	SD87	DEN88	SD88	DEN89	SD89
HAFL	N	A	.09	.06	0.00	0.00	.32	.26
	N	C	.60	.60	.06	.10	.11	.19
	N	M	.01	.01	0.00	0.00	.05	.03
	S	A	.00	.01	0.00	0.00	.06	.09
	S	C	.20	.19	.11	.10	.11	.20
	S	M	.02	.02	0.00	0.00	.04	.05
HAWO	N	A	.08	.06	.10	.07	.16	.14
	N	C	.07	.08	.02	.02	.05	.02
	N	M	.06	.03	.02	.01	.09	.09
	S	A	.04	.06	.07	.08	.10	.14
	S	C	.07	.08	.17	.18	.17	.09
	S	M	.06	.08	.07	.04	.07	.04
HETH	N	A	.04	.04	.04	.04	.07	.06
	N	C	.19	.04	.30	.05	.20	.06
	N	M	.15	.08	.14	.03	.10	.02
	S	A	.18	.09	.20	.08	.30	.39
	S	C	.24	.08	.44	.04	.34	.05
	S	M	.39	.20	.32	.06	.15	.02
HOFI	N	A	0.00	0.00	0.00	0.00	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	0.00	0.00	.00	.01
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00
HOSP	N	A	0.00	0.00	0.00	0.00	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	.00	.00	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00
HOWR	N	A	3.18	.97	4.03	.97	3.02	.45
	N	C	.01	.01	0.00	0.00	.05	.03
	N	M	.07	.06	.02	.04	.02	.00
	S	A	2.09	.80	3.27	.98	2.73	.73
	S	C	.34	.57	.02	.03	.04	.03
	S	M	1.02	.56	.95	.39	1.02	.38

Table 5 (cont). Density (DEN) and standard deviation (SD) of density for 84 species of birds observed in the avian response to habitat study in the Central Rocky Mountains, 1987-89.

BIRD	REGION	TREETYPE	DEN87	SD87	DEN88	SD88	DEN89	SD89
LABU	N	A	0.00	0.00	0.00	0.00	.01	.01
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	.00	.00	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	.00	.00	0.00	0.00	0.00	0.00
LEFL	N	A	.00	.00	0.00	0.00	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	.01	.02	.01	.02
LISP	N	A	.93	.45	1.80	.36	.94	.43
	N	C	.04	.01	.35	.56	.05	.06
	N	M	.05	.07	.07	.07	.12	.14
	S	A	1.10	1.00	1.62	.67	2.30	1.13
	S	C	.01	.01	.02	.01	.05	.03
	S	M	.82	.62	.47	.19	1.23	.67
MAWA	N	A	0.00	0.00	.00	.01	.01	.02
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00
MGWA	N	A	.14	.10	.33	.26	.10	.11
	N	C	.01	.01	0.00	0.00	0.00	0.00
	N	M	.02	.00	.03	.02	0.00	0.00
	S	A	.17	.08	.22	.10	.29	.19
	S	C	.00	.01	.01	.01	.01	.01
	S	M	.04	.05	.08	.06	.03	.03
MOBL	N	A	.01	.01	.01	.03	.03	.05
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	.00	.00	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00

Table 5 (cont). Density (DEN) and standard deviation (SD) of density for 84 species of birds observed in the avian response to habitat study in the Central Rocky Mountains, 1987-89.

BIRD	REGION	TREETYPE	DEN87	SD87	DEN88	SD88	DEN89	SD89
MOCH	N	A	.32	.30	.06	.11	.22	.17
	N	C	1.40	.32	1.40	.20	2.23	.29
	N	M	.67	.13	.46	.14	.96	.15
	S	A	.09	.04	.09	.09	.22	.32
	S	C	.67	.13	1.10	.40	2.04	.23
	S	M	1.01	.03	.95	.31	1.33	.69
NOFL	N	A	.21	.08	.16	.10	.14	.08
	N	C	.03	.03	.03	.04	0.00	0.00
	N	M	.40	.50	.15	.11	.02	.01
	S	A	.09	.07	.14	.10	.08	.05
	S	C	.04	.02	.03	.03	.01	.01
	S	M	.11	.07	.07	.01	.05	.05
OCWA	N	A	.28	.27	.66	.48	.59	.34
	N	C	.01	.01	.04	.01	.04	.03
	N	M	.13	.09	.10	.05	.20	.09
	S	A	.16	.23	.10	.07	.15	.15
	S	C	.05	.07	.02	.03	.01	.02
	S	M	.17	.16	.17	.02	.14	.03
OSFL	N	A	.01	.02	0.00	0.00	.00	.01
	N	C	.51	.24	.80	1.10	.51	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	.00	.00	0.00	0.00	.02	.03
	S	C	.14	.18	.23	.39	.51	.89
	S	M	.03	.05	0.00	0.00	.04	.08
PIGR	N	A	0.00	0.00	0.00	0.00	0.00	0.00
	N	C	.10	.14	.04	.05	.19	.12
	N	M	.01	.01	0.00	0.00	0.00	0.00
	S	A	.01	.01	0.00	0.00	0.00	0.00
	S	C	.24	.03	.21	.06	.24	.11
	S	M	.02	.01	.01	.01	.06	.11
PISI	N	A	.87	1.14	.53	.59	.09	.10
	N	C	3.21	1.44	1.98	.96	8.43	2.88
	N	M	1.49	.63	7.23	4.98	.48	.18
	S	A	.78	.61	1.09	.52	.48	.43
	S	C	2.49	.37	3.97	2.62	2.95	.31
	S	M	3.52	.26	3.12	2.41	1.81	1.63

Table 5 (cont). Density (DEN) and standard deviation (SD) of density for 84 species of birds observed in the avian response to habitat study in the Central Rocky Mountains, 1987-89.

BIRD	REGION	TREETYPE	DEN87	SD87	DEN88	SD88	DEN89	SD89
PIWA	N	A	0.00	0.00	.00	.01	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00
PUMA	N	A	0.00	0.00	.01	.02	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	.03	.04	.11	.22	.25	.28
	S	C	0.00	0.00	.01	.01	.01	.01
	S	M	0.00	0.00	0.00	0.00	.02	.02
RBNU	N	A	.02	.03	.01	.01	.01	.01
	N	C	.31	.00	.23	.01	.44	.25
	N	M	.34	.07	.30	.18	.35	.24
	S	A	.01	.01	.01	.02	.00	.00
	S	C	.23	.17	.27	.08	.23	.05
	S	M	.24	.11	.21	.04	.22	.13
RCKI	N	A	.05	.08	.06	.13	.77	1.18
	N	C	.75	.16	1.26	.25	1.70	.23
	N	M	.48	.19	.70	.05	.76	.34
	S	A	.04	.05	.07	.10	.08	.08
	S	C	.68	.16	1.52	.13	1.72	.04
	S	M	1.39	.39	1.34	.42	1.09	.19
RECR	N	A	.00	.01	0.00	0.00	.01	.01
	N	C	.09	.09	.07	.07	.10	.05
	N	M	.31	.18	.02	.02	.11	.10
	S	A	.02	.02	0.00	0.00	.01	.02
	S	C	.39	.28	.13	.09	.89	.73
	S	M	.28	.31	.04	.04	.04	.07
REVI	N	A	.01	.02	0.00	0.00	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00

Table 5 (cont). Density (DEN) and standard deviation (SD) of density for 84 species of birds observed in the avian response to habitat study in the Central Rocky Mountains, 1987-89.

BIRD	REGION	TREETYPE	DEN87	SD87	DEN88	SD88	DEN89	SD89
RNSA	N	A	.07	.04	.05	.04	.10	.07
	N	C	0.00	0.00	0.00	0.00	.03	.05
	N	M	.01	.01	0.00	0.00	.01	.01
	S	A	.05	.03	.08	.09	.07	.07
	S	C	.07	.06	0.00	0.00	.01	.01
	S	M	.03	.02	.08	.14	.05	.05
RSTO	N	A	.00	.01	0.00	0.00	0.00	0.00
	N	C	.01	.01	0.00	0.00	0.00	0.00
	N	M	.03	.04	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00
RUHU	N	A	.20	.59	0.00	0.00	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	.01	.02	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00
RWBL	N	A	.01	.02	.01	.02	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	.00	.01	.00	.01	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00
RWSW	N	A	0.00	0.00	0.00	0.00	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	0.00	0.00	0.00	0.00
	S	C	.01	.02	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00
SOSP	N	A	0.00	0.00	.00	.01	.00	.01
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	.03	.05	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00

Table 5 (cont). Density (DEN) and standard deviation (SD) of density for 84 species of birds observed in the avian response to habitat study in the Central Rocky Mountains, 1987-89.

BIRD	REGION	TREETYPE	DEN87	SD87	DEN88	SD88	DEN89	SD89
SOVI	N	A	0.00	0.00	0.00	0.00	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	.00	.01	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00
STJA	N	A	.01	.02	.03	.02	.01	.02
	N	C	.01	.01	0.00	0.00	.05	.05
	N	M	.11	.07	.05	.02	.08	.05
	S	A	.00	.01	.00	.00	.00	.00
	S	C	0.00	0.00	.02	.01	.02	.03
	S	M	.03	.01	.04	.07	.08	.01
SWTH	N	A	.01	.01	0.00	0.00	0.00	0.00
	N	C	.02	.01	.05	.04	.00	.00
	N	M	.01	.01	0.00	0.00	.00	.00
	S	A	.02	.03	0.00	0.00	0.00	0.00
	S	C	.01	.02	.02	.01	.00	.00
	S	M	.01	.01	.01	.01	0.00	0.00
TOSO	N	A	.00	.01	.01	.02	.01	.01
	N	C	.01	.01	.01	.01	0.00	0.00
	N	M	.01	.01	.01	.01	.00	.00
	S	A	.00	.00	.00	.00	.00	.00
	S	C	.00	.00	.00	.00	0.00	0.00
	S	M	0.00	0.00	.00	.00	.00	.00
TOWA	N	A	.00	.00	0.00	0.00	0.00	0.00
	N	C	.01	.02	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00
TRSW	N	A	.99	.78	.82	.65	.83	.76
	N	C	.04	.04	.02	.02	0.00	0.00
	N	M	.05	.03	.07	.05	.14	.10
	S	A	.21	.27	.53	.42	.98	.65
	S	C	.01	.01	.04	.04	.06	.07
	S	M	.07	.09	.35	.40	.92	1.35

Table 5 (cont). Density (DEN) and standard deviation (SD) of density for 84 species of birds observed in the avian response to habitat study in the Central Rocky Mountains, 1987-89.

BIRD	REGION	TREETYPE	DEN87	SD87	DEN88	SD88	DEN89	SD89
TTWO	N	A	0.00	0.00	0.00	0.00	0.00	0.00
	N	C	.07	.08	.15	.16	.03	.03
	N	M	.03	.05	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	0.00	0.00	.01	.02
	S	C	.05	.08	0.00	0.00	.13	.20
	S	M	0.00	0.00	0.00	0.00	.19	.17
VEER	N	A	0.00	0.00	.00	.00	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00
VESP	N	A	.00	.00	0.00	0.00	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	.00	.00	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	.00	.00	0.00	0.00	0.00	0.00
VGSW	N	A	.09	.12	.01	.02	0.00	0.00
	N	C	.00	.01	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	.19	.12	.09	.10	.06	.11
	S	C	.03	.04	.04	.03	0.00	0.00
	S	M	.12	.10	0.00	0.00	0.00	0.00
WAVI	N	A	2.26	.45	2.66	.41	2.58	.39
	N	C	0.00	0.00	0.00	0.00	.02	.02
	N	M	.59	.11	.63	.15	.68	.34
	S	A	2.28	.31	2.86	.65	3.21	.46
	S	C	.10	.07	.05	.05	.18	.18
	S	M	1.12	.58	1.00	.31	1.24	.15
WBNU	N	A	0.00	0.00	0.00	0.00	0.00	0.00
	N	C	0.00	0.00	.02	.01	0.00	0.00
	N	M	.00	.00	.01	.02	0.00	0.00
	S	A	.01	.01	.01	.01	.02	.02
	S	C	.00	.00	.00	.01	.05	.05
	S	M	0.00	0.00	.00	.01	.01	.02

Table 5 (cont). Density (DEN) and standard deviation (SD) of density for 84 species of birds observed in the avian response to habitat study in the Central Rocky Mountains, 1987-89.

BIRD	REGION	TREETYPE	DEN87	SD87	DEN88	SD88	DEN89	SD89
WCSP	N	A	.06	.17	.09	.24	.05	.13
	N	C	.01	.01	.01	.01	.02	.03
	N	M	.00	.01	0.00	0.00	0.00	0.00
	S	A	.46	.48	.69	.55	.61	.54
	S	C	.01	.01	.01	.01	.01	.02
	S	M	.15	.09	.40	.36	.41	.36
WEFL	N	A	.02	.01	.00	.01	.01	.02
	N	C	.11	.18	.17	.17	.28	.10
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	.01	.01	.02	.02	.00	.01
	S	C	.14	.18	0.00	0.00	.06	.10
	S	M	.10	.13	.07	.06	.04	.04
WEME	N	A	0.00	0.00	.00	.01	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00
WETA	N	A	.32	.16	.16	.10	.33	.10
	N	C	.42	.49	.32	.29	.36	.39
	N	M	.43	.15	.38	.09	.16	.12
	S	A	.03	.04	.26	.22	.07	.07
	S	C	.09	.09	.32	.32	.57	.42
	S	M	.20	.15	.51	.20	.51	.38
WIFL	N	A	0.00	0.00	0.00	0.00	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	.00	.01	.00	.01
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	0.00	0.00
WISA	N	A	0.00	0.00	0.00	0.00	0.00	0.00
	N	C	.04	.02	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	0.00	0.00	0.00	0.00
	S	C	.06	.09	0.00	0.00	.01	.01
	S	M	0.00	0.00	0.00	0.00	.02	.03

Table 5 (cont). Density (DEN) and standard deviation (SD) of density for 84 species of birds observed in the avian response to habitat study in the Central Rocky Mountains, 1987-89.

BIRD	REGION	TREETYPE	DEN87	SD87	DEN88	SD88	DEN89	SD89
WIWA	N	A	0.00	0.00	0.00	0.00	0.00	0.00
	N	C	0.00	0.00	.01	.01	.02	.03
	N	M	0.00	0.00	.01	.01	0.00	0.00
	S	A	.04	.06	.01	.01	.02	.04
	S	C	0.00	0.00	.02	.03	.02	.03
	S	M	.34	.57	0.00	0.00	0.00	0.00
WTSW	N	A	0.00	0.00	0.00	0.00	0.00	0.00
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	.00	.01	0.00	0.00	0.00	0.00
	S	C	0.00	0.00	0.00	0.00	0.00	0.00
	S	M	0.00	0.00	0.00	0.00	.01	.02
WWCR	N	A	0.00	0.00	0.00	0.00	0.00	0.00
	N	C	0.00	0.00	.06	.10	.07	.07
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	0.00	0.00	.01	.02	0.00	0.00
	S	C	.00	.01	.50	.53	.02	.03
	S	M	0.00	0.00	.04	.04	0.00	0.00
WWPE	N	A	.78	.50	.91	.74	.90	.81
	N	C	.07	.06	.23	.26	.23	.26
	N	M	.01	.00	.01	.01	.01	.02
	S	A	.54	.32	1.04	.46	1.16	.62
	S	C	.17	.09	.11	.10	.46	.57
	S	M	.18	.22	.44	.37	.44	.31
YEWA	N	A	.02	.02	.00	.01	.00	.01
	N	C	0.00	0.00	0.00	0.00	0.00	0.00
	N	M	0.00	0.00	0.00	0.00	0.00	0.00
	S	A	.05	.08	.10	.09	.26	.18
	S	C	.00	.01	0.00	0.00	.04	.06
	S	M	.02	.03	0.00	0.00	.02	.02
YRWA	N	A	1.22	.46	.78	.50	1.43	.40
	N	C	1.29	.39	1.26	.30	.61	.14
	N	M	1.41	.13	1.60	.39	1.01	.31
	S	A	1.73	.99	1.76	.36	1.68	.34
	S	C	0.00	0.00	2.29	.81	2.26	.60
	S	M	2.67	1.13	2.26	.42	2.06	.27

Table 6. Repeated measures analysis of variance table for American Robin densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.17	0.17	0.12	0.73	
TREETYPE	2	8.42	4.21	2.99	0.07	
REGION*TREETYPE	2	12.63	6.31	4.49	0.02	
ERROR(PLOT)	24	33.74	1.41			
YEAR	2	0.02	0.01	0.04		0.96
YEAR*REGION	2	2.95	1.48	7.73		0.00
YEAR*TREETYPE	4	0.75	0.19	0.98		0.43
YEAR*REGION*TREETYPE	4	4.10	1.03	5.37		0.00
ERROR(YEAR)	48	9.16	0.19			

Huynh-Feldt Epsilon = 1.1131

* Huynh-Feldt

Table 7. Least squares means for American Robin densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains in the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				**
NORTH ASPEN	2.01	1.47	2.56	
NORTH CONIFER	0.65	0.65	0.41	
NORTH MIXED	1.86	1.04	1.32	
SOUTH ASPEN	1.18	1.40	0.70	
SOUTH CONIFER	0.67	1.33	1.41	
SOUTH MIXED	1.77	2.44	1.95	
REGION				**
NORTH	1.50	1.05	1.43	
SOUTH	1.21	1.72	1.35	
TREETYPE				
ASPEN	1.59	1.43	1.63	
CONIFER	0.66	0.99	0.91	
MIXED	1.82	1.74	1.63	
TOTAL	1.36	1.39	1.39	

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				*
NORTH	2.01	0.57	1.41	
SOUTH	1.09	1.14	2.05	
TOTAL	1.55	0.85	1.73	

REGION	
NORTH	1.33
SOUTH	1.43
TOTAL	1.38

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 8. Repeated measures analysis of variance table for Black-capped Chickadee densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.52	0.52	7.80	0.01	
TREETYPE	2	1.05	0.53	7.94	0.00	
REGION*TREETYPE	2	0.41	0.21	3.10	0.06	
ERROR(PLOT)	24	1.59	0.07			
YEAR	2	0.04	0.02	0.80		0.45
YEAR*REGION	2	0.02	0.01	0.48		0.62
YEAR*TREETYPE	4	0.11	0.03	1.22		0.31
YEAR*REGION*TREETYPE	4	0.08	0.02	0.87		0.49
ERROR(YEAR)	48	1.11	0.02			

Huynh-Feldt Epsilon = 1.2583

* Huynh-Feldt

Table 9. Least squares means for Black-capped Chickadee densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR		
	1987	1988	1989
REGION*TREETYPE			
NORTH ASPEN	0.52	0.44	0.53
NORTH CONIFER	0.00	0.12	0.12
NORTH MIXED	0.17	0.38	0.12
SOUTH ASPEN	0.14	0.15	0.18
SOUTH CONIFER	0.04	0.08	0.12
SOUTH MIXED	0.02	0.05	0.06
REGION			
NORTH	0.23	0.31	0.26
SOUTH	0.07	0.09	0.12
TREETYPE			
ASPEN	0.33	0.29	0.35
CONIFER	0.02	0.10	0.12
MIXED	0.10	0.22	0.09
TOTAL	0.15	0.20	0.19

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.49	0.08	0.22	
SOUTH	0.16	0.08	0.04	
TOTAL	0.32	0.08	0.13	**

REGION		**
NORTH	0.27	
SOUTH	0.09	
TOTAL	0.18	

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 10. Repeated measures analysis of variance table for Black-headed Grosbeak densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.01	0.01	0.81	0.38	
TREETYPE	2	0.03	0.02	1.10	0.35	
REGION*TREETYPE	2	0.01	0.01	0.40	0.68	
ERROR(PLOT)	24	0.35	0.01			
YEAR	2	0.01	0.01	0.45		0.64
YEAR*REGION	2	0.00	0.00	0.11		0.90
YEAR*TREETYPE	4	0.01	0.00	0.19		0.94
YEAR*REGION*TREETYPE	4	0.01	0.00	0.16		0.96
ERROR(YEAR)	48	0.64	0.01			

Huynh-Feldt Epsilon = 0.7297

* Huynh-Feldt

Table 11. Least squares means for Black-headed Grosbeak densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR		
	1987	1988	1989
REGION*TREETYPE			
NORTH ASPEN	0.02	0.06	0.11
NORTH CONIFER	0.00	0.01	0.01
NORTH MIXED	0.01	0.00	0.00
SOUTH ASPEN	0.04	0.07	0.08
SOUTH CONIFER	0.02	0.04	0.04
SOUTH MIXED	0.02	0.09	0.05
REGION			
NORTH	0.01	0.02	0.04
SOUTH	0.03	0.07	0.06
TREETYPE			
ASPEN	0.03	0.06	0.09
CONIFER	0.01	0.03	0.03
MIXED	0.01	0.05	0.03
TOTAL	0.02	0.04	0.05

	TREETYPE		
	ASPEN	CONIFER	MIXED
REGION			
NORTH	0.07	0.01	0.00
SOUTH	0.06	0.04	0.05
TOTAL	0.06	0.02	0.03

REGION	
NORTH	0.02
SOUTH	0.05
TOTAL	0.04

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 12. Repeated measures analysis of variance table for Broad-tailed Hummingbird densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	66.47	66.47	4.12	0.05	
TREETYPE	2	644.49	322.24	19.98	0.00	
REGION*TREETYPE	2	98.37	49.18	3.05	0.07	
ERROR(PLOT)	24	387.17	16.13			
YEAR	2	5.62	2.81	1.31		0.28
YEAR*REGION	2	7.44	3.72	1.74		0.19
YEAR*TREETYPE	4	11.71	2.93	1.37		0.26
YEAR*REGION*TREETYPE	4	15.85	3.96	1.85		0.13
ERROR(YEAR)	48	102.74	2.14			

Huynh-Feldt Epsilon = 1.3142

* Huynh-Feldt

Table 13. Least squares means for Broad-tailed Hummingbird densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR		
	1987	1988	1989
REGION*TREETYPE			
NORTH ASPEN	3.90	3.27	3.41
NORTH CONIFER	0.24	0.13	0.18
NORTH MIXED	0.22	0.18	0.23
SOUTH ASPEN	6.83	7.51	10.63
SOUTH CONIFER	0.39	0.67	0.57
SOUTH MIXED	0.91	0.76	1.11
REGION			
NORTH	1.45	1.19	1.27
SOUTH	2.71	2.98	4.10
TREETYPE			
ASPEN	5.36	5.39	7.02
CONIFER	0.32	0.40	0.38
MIXED	0.56	0.47	0.67
TOTAL	2.08	2.09	2.69

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	3.53	0.18	0.21	
SOUTH	8.32	0.54	0.92	
TOTAL	5.93	0.36	0.57	**

REGION		*
NORTH	1.31	
SOUTH	3.26	
TOTAL	2.29	

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 14. Repeated measures analysis of variance table for Brown Creeper densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.05	0.05	3.33	0.08	
TREETYPE	2	1.22	0.61	44.22	0.00	
REGION*TREETYPE	2	0.03	0.02	1.26	0.30	
ERROR(PLOT)	24	0.33	0.01			
YEAR	2	0.02	0.01	6.07		0.00
YEAR*REGION	2	0.27	0.14	67.02		0.00
YEAR*TREETYPE	4	0.02	0.01	2.59		0.05
YEAR*REGION*TREETYPE	4	0.33	0.08	41.43		0.00
ERROR(YEAR)	48	0.10	0.00			

Huynh-Feldt Epsilon = 1.2090

* Huynh-Feldt

Table 15. Least squares means for Brown Creeper densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				**
NORTH ASPEN	0.00	0.00	0.00	
NORTH CONIFER	0.52	0.39	0.11	
NORTH MIXED	0.23	0.14	0.07	
SOUTH ASPEN	0.01	0.00	0.01	
SOUTH CONIFER	0.16	0.17	0.47	
SOUTH MIXED	0.05	0.08	0.06	
REGION				**
NORTH	0.25	0.18	0.06	
SOUTH	0.07	0.08	0.18	
TREETYPE				*
ASPEN	0.00	0.00	0.00	
CONIFER	0.34	0.28	0.29	
MIXED	0.14	0.11	0.06	
TOTAL	0.16	0.13	0.12	**

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.00	0.34	0.15	
SOUTH	0.00	0.27	0.06	
TOTAL	0.00	0.30	0.10	**

REGION	
NORTH	0.16
SOUTH	0.11
TOTAL	0.14

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 16. Repeated measures analysis of variance table for Brown-headed Cowbird densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.05	0.05	0.12	0.73	
TREETYPE	2	6.82	3.41	8.27	0.00	
REGION*TREETYPE	2	0.26	0.13	0.32	0.73	
ERROR(PLOT)	24	9.89	0.41			
YEAR	2	0.22	0.11	1.98		0.15
YEAR*REGION	2	0.16	0.08	1.40		0.26
YEAR*TREETYPE	4	0.45	0.11	1.97		0.11
YEAR*REGION*TREETYPE	4	0.22	0.06	0.98		0.43
ERROR(YEAR)	48	2.71	0.06			

Huynh-Feldt Epsilon = 1.1775

* Huynh-Feldt

Table 17. Least squares means for Brown-headed Cowbird densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR		
	1987	1988	1989
REGION*TREETYPE			
NORTH ASPEN	0.90	0.94	0.57
NORTH CONIFER	0.00	0.05	0.02
NORTH MIXED	0.57	0.15	0.20
SOUTH ASPEN	0.63	0.74	0.44
SOUTH CONIFER	0.04	0.02	0.03
SOUTH MIXED	0.23	0.42	0.36
REGION			
NORTH	0.49	0.38	0.26
SOUTH	0.30	0.39	0.28
TREETYPE			
ASPEN	0.77	0.84	0.50
CONIFER	0.02	0.03	0.03
MIXED	0.40	0.28	0.28
TOTAL	0.40	0.39	0.27

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.80	0.02	0.31	
SOUTH	0.60	0.03	0.34	
TOTAL	0.70	0.03	0.32	**

REGION	
NORTH	0.38
SOUTH	0.32
TOTAL	0.35

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 18. Repeated measures analysis of variance table for Cassin's Finch densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.17	0.17	4.07	0.06	
TREETYPE	2	0.03	0.01	0.32	0.73	
REGION*TREETYPE	2	0.03	0.02	0.41	0.67	
ERROR(PLOT)	24	0.99	0.04			
YEAR	2	0.00	0.00	0.10		0.91
YEAR*REGION	2	0.00	0.00	0.07		0.93
YEAR*TREETYPE	4	0.00	0.00	0.28		0.89
YEAR*REGION*TREETYPE	4	0.01	0.00	0.72		0.58
ERROR(YEAR)	48	0.19	0.00			

Huynh-Feldt Epsilon = 1.2438

* Huynh-Feldt

Table 19. Least squares means for Cassin's Finch densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR		
	1987	1988	1989
REGION*TREETYPE			
NORTH ASPEN	0.16	0.11	0.13
NORTH CONIFER	0.16	0.21	0.19
NORTH MIXED	0.08	0.08	0.08
SOUTH ASPEN	0.04	0.06	0.05
SOUTH CONIFER	0.02	0.02	0.03
SOUTH MIXED	0.02	0.03	0.03
REGION			
NORTH	0.13	0.13	0.13
SOUTH	0.03	0.04	0.04
TREETYPE			
ASPEN	0.10	0.09	0.09
CONIFER	0.09	0.11	0.11
MIXED	0.05	0.06	0.06
TOTAL	0.08	0.09	0.09

	TREETYPE		
	ASPEN	CONIFER	MIXED
REGION			
NORTH	0.13	0.19	0.08
SOUTH	0.05	0.02	0.03
TOTAL	0.09	0.10	0.05

REGION	
NORTH	0.13
SOUTH	0.03
TOTAL	0.08

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 20. Repeated measures analysis of variance table for Chipping Sparrow densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.02	0.02	1.00	0.33	
TREETYPE	2	0.02	0.01	0.59	0.56	
REGION*TREETYPE	2	0.04	0.02	0.93	0.41	
ERROR(PLOT)	24	0.46	0.02			
YEAR	2	0.03	0.02	0.80		0.45
YEAR*REGION	2	0.03	0.02	0.77		0.47
YEAR*TREETYPE	4	0.09	0.02	1.11		0.36
YEAR*REGION*TREETYPE	4	0.06	0.02	0.75		0.56
ERROR(YEAR)	48	0.97	0.02			

Huynh-Feldt Epsilon = 0.6299

* Huynh-Feldt

Table 21. Least squares means for Chipping Sparrow densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR		
	1987	1988	1989
REGION*TREETYPE			
NORTH ASPEN	0.01	0.02	0.26
NORTH CONIFER	0.04	0.03	0.00
NORTH MIXED	0.01	0.01	0.06
SOUTH ASPEN	0.00	0.01	0.02
SOUTH CONIFER	0.03	0.00	0.00
SOUTH MIXED	0.04	0.01	0.03
REGION			
NORTH	0.02	0.02	0.11
SOUTH	0.02	0.01	0.02
TREETYPE			
ASPEN	0.01	0.01	0.14
CONIFER	0.03	0.02	0.00
MIXED	0.02	0.01	0.04
TOTAL	0.02	0.01	0.06

	TREETYPE		
	ASPEN	CONIFER	MIXED
REGION			
NORTH	0.10	0.02	0.02
SOUTH	0.01	0.01	0.03
TOTAL	0.05	0.02	0.02

REGION	
NORTH	0.05
SOUTH	0.01
TOTAL	0.03

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 22. Repeated measures analysis of variance table for Clark's Nutcracker densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.01	0.01	4.22	0.05	
TREETYPE	2	0.04	0.02	9.72	0.00	
REGION*TREETYPE	2	0.01	0.01	3.26	0.06	
ERROR(PLOT)	24	0.05	0.00			
YEAR	2	0.00	0.00	3.93		0.03
YEAR*REGION	2	0.00	0.00	2.50		0.09
YEAR*TREETYPE	4	0.01	0.00	3.98		0.01
YEAR*REGION*TREETYPE	4	0.00	0.00	1.77		0.15
ERROR(YEAR)	48	0.02	0.00			

Huynh-Feldt Epsilon = 0.6516

* Huynh-Feldt

Table 23. Least squares means for Clark's Nutcracker densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				
NORTH ASPEN	0.00	0.00	0.00	
NORTH CONIFER	0.14	0.05	0.08	
NORTH MIXED	0.01	0.02	0.00	
SOUTH ASPEN	0.00	0.00	0.00	
SOUTH CONIFER	0.03	0.02	0.02	
SOUTH MIXED	0.00	0.01	0.00	
REGION				
NORTH	0.05	0.02	0.03	
SOUTH	0.01	0.01	0.01	
TREETYPE				**
ASPEN	0.00	0.00	0.00	
CONIFER	0.09	0.04	0.05	
MIXED	0.01	0.01	0.00	
TOTAL	0.03	0.02	0.02	*

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.00	0.09	0.01	
SOUTH	0.00	0.02	0.00	
TOTAL	0.00	0.06	0.01	**

REGION		*
NORTH	0.03	
SOUTH	0.01	
TOTAL	0.02	

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 24. Repeated measures analysis of variance table for Common Raven densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.01	0.01	11.72	0.00	
TREETYPE	2	0.00	0.00	0.98	0.39	
REGION*TREETYPE	2	0.00	0.00	0.83	0.45	
ERROR(PLOT)	24	0.02	0.00			
YEAR	2	0.00	0.00	1.25		0.30
YEAR*REGION	2	0.00	0.00	1.59		0.21
YEAR*TREETYPE	4	0.00	0.00	1.08		0.38
YEAR*REGION*TREETYPE	4	0.00	0.00	1.17		0.34
ERROR(YEAR)	48	0.02	0.00			

Huynh-Feldt Epsilon = 1.0649

* Huynh-Feldt

Table 25. Least squares means for Common Raven densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR		
	1987	1988	1989
REGION*TREETYPE			
NORTH ASPEN	0.00	0.00	0.00
NORTH CONIFER	0.00	0.00	0.00
NORTH MIXED	0.00	0.00	0.00
SOUTH ASPEN	0.04	0.03	0.03
SOUTH CONIFER	0.00	0.01	0.03
SOUTH MIXED	0.03	0.03	0.06
REGION			
NORTH	0.00	0.00	0.00
SOUTH	0.02	0.02	0.04
TREETYPE			
ASPEN	0.02	0.02	0.02
CONIFER	0.00	0.00	0.02
MIXED	0.01	0.01	0.03
TOTAL	0.01	0.01	0.02

	TREETYPE		
	ASPEN	CONIFER	MIXED
REGION			
NORTH	0.00	0.00	0.00
SOUTH	0.03	0.01	0.04
TOTAL	0.02	0.01	0.02

REGION		**
NORTH	0.00	
SOUTH	0.03	
TOTAL	0.01	

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 26. Repeated measures analysis of variance table for Dark-eyed Junco densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	2.06	2.06	1.12	0.30	
TREETYPE	2	70.36	35.18	19.11	0.00	
REGION*TREETYPE	2	8.55	4.27	2.32	0.12	
ERROR(PLOT)	24	44.18	1.84			
YEAR	2	7.80	3.90	6.56		0.00
YEAR*REGION	2	13.07	6.54	10.99		0.00
YEAR*TREETYPE	4	2.30	0.58	0.97		0.43
YEAR*REGION*TREETYPE	4	29.24	7.31	12.29		0.00
ERROR(YEAR)	48	28.55	0.59			

Huynh-Feldt Epsilon = 0.9666

* Huynh-Feldt

Table 27. Least squares means for Dark-eyed Junco densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				**
NORTH ASPEN	2.19	1.09	2.68	
NORTH CONIFER	2.72	1.49	2.28	
NORTH MIXED	3.50	5.95	5.41	
SOUTH ASPEN	2.93	2.30	1.84	
SOUTH CONIFER	2.15	1.19	2.54	
SOUTH MIXED	5.95	2.53	2.77	
REGION				**
NORTH	2.80	2.84	3.46	
SOUTH	3.68	2.01	2.38	
TREETYPE				
ASPEN	2.56	1.70	2.26	
CONIFER	2.44	1.34	2.41	
MIXED	4.72	4.24	4.09	
TOTAL	3.24	2.42	2.92	**

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	1.98	2.16	4.95	
SOUTH	2.36	1.96	3.75	
TOTAL	2.17	2.06	4.35	**

REGION	
NORTH	3.03
SOUTH	2.69
TOTAL	2.86

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 28. Repeated measures analysis of variance table for Downy Woodpecker densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.00	0.00	0.60	0.45	
TREETYPE	2	0.03	0.01	5.30	0.01	
REGION*TREETYPE	2	0.01	0.01	2.41	0.11	
ERROR(PLOT)	24	0.06	0.00			
YEAR	2	0.00	0.00	0.64		0.53
YEAR*REGION	2	0.00	0.00	0.26		0.77
YEAR*TREETYPE	4	0.00	0.00	0.33		0.86
YEAR*REGION*TREETYPE	4	0.00	0.00	0.30		0.88
ERROR(YEAR)	48	0.07	0.00			

Huynh-Feldt Epsilon = 1.1417

* Huynh-Feldt

Table 29. Least squares means for Downy Woodpecker densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR		
	1987	1988	1989
REGION*TREETYPE			
NORTH ASPEN	0.07	0.06	0.07
NORTH CONIFER	0.01	0.00	0.01
NORTH MIXED	0.01	0.00	0.00
SOUTH ASPEN	0.03	0.01	0.03
SOUTH CONIFER	0.04	0.01	0.00
SOUTH MIXED	0.00	0.02	0.00
REGION			
NORTH	0.03	0.02	0.03
SOUTH	0.03	0.01	0.01
TREETYPE			
ASPEN	0.05	0.03	0.05
CONIFER	0.02	0.00	0.01
MIXED	0.01	0.01	0.00
TOTAL	0.03	0.02	0.02

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.07	0.01	0.00	
SOUTH	0.02	0.02	0.01	
TOTAL	0.04	0.01	0.01	**

REGION	
NORTH	0.03
SOUTH	0.02
TOTAL	0.02

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 30. Repeated measures analysis of variance table for Dusky Flycatcher densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.17	0.17	1.58	0.22	
TREETYPE	2	2.81	1.40	12.73	0.00	
REGION*TREETYPE	2	0.44	0.22	1.98	0.16	
ERROR(PLOT)	24	2.65	0.11			
YEAR	2	0.04	0.02	1.00		0.37
YEAR*REGION	2	0.15	0.08	3.81		0.03
YEAR*TREETYPE	4	0.17	0.04	2.10		0.10
YEAR*REGION*TREETYPE	4	0.17	0.04	2.17		0.09
ERROR(YEAR)	48	0.96	0.02			

Huynh-Feldt Epsilon = 1.2251

* Huynh-Feldt

Table 31. Least squares means for Dusky Flycatcher densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				
NORTH ASPEN	0.59	0.70	0.32	
NORTH CONIFER	0.18	0.00	0.00	
NORTH MIXED	0.00	0.03	0.00	
SOUTH ASPEN	0.13	0.29	0.32	
SOUTH CONIFER	0.00	0.00	0.00	
SOUTH MIXED	0.04	0.04	0.08	
REGION				*
NORTH	0.26	0.24	0.11	
SOUTH	0.06	0.11	0.13	
TREETYPE				
ASPEN	0.36	0.49	0.32	
CONIFER	0.09	0.00	0.00	
MIXED	0.02	0.03	0.04	
TOTAL	0.16	0.18	0.12	

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.53	0.06	0.01	
SOUTH	0.25	0.00	0.05	
TOTAL	0.39	0.03	0.03	**

REGION	
NORTH	0.20
SOUTH	0.10
TOTAL	0.15

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 32. Repeated measures analysis of variance table for Evening Grosbeak densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	1.01	1.01	5.15	0.03	
TREETYPE	2	0.42	0.21	1.06	0.36	
REGION*TREETYPE	2	0.83	0.42	2.13	0.14	
ERROR(PLOT)	24	4.70	0.20			
YEAR	2	0.63	0.32	4.56		0.02
YEAR*REGION	2	0.42	0.21	3.04		0.06
YEAR*TREETYPE	4	0.22	0.06	0.80		0.53
YEAR*REGION*TREETYPE	4	0.34	0.09	1.23		0.31
ERROR(YEAR)	48	3.32	0.07			

Huynh-Feldt Epsilon = 0.7933

* Huynh-Feldt

Table 33. Least squares means for Evening Grosbeak densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				
NORTH ASPEN	0.22	0.10	0.04	
NORTH CONIFER	0.02	0.02	0.04	
NORTH MIXED	0.01	0.00	0.09	
SOUTH ASPEN	0.34	0.03	0.07	
SOUTH CONIFER	0.25	0.19	0.15	
SOUTH MIXED	1.04	0.28	0.35	
REGION				
NORTH	0.09	0.04	0.06	
SOUTH	0.55	0.17	0.19	
TREETYPE				
ASPEN	0.28	0.07	0.06	
CONIFER	0.14	0.10	0.10	
MIXED	0.53	0.14	0.22	
TOTAL	0.32	0.10	0.13	*

	TREETYPE		
	ASPEN	CONIFER	MIXED
REGION			
NORTH	0.12	0.03	0.04
SOUTH	0.15	0.20	0.56
TOTAL	0.13	0.11	0.30

REGION		*
NORTH	0.06	
SOUTH	0.30	
TOTAL	0.18	

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 34. Repeated measures analysis of variance table for Golden-crowned Kinglet densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.53	0.53	48.75	0.00	
TREETYPE	2	10.04	5.02	461.69	0.00	
REGION*TREETYPE	2	0.40	0.20	18.27	0.00	
ERROR(PLOT)	24	0.26	0.01			
YEAR	2	0.41	0.21	10.27		0.00
YEAR*REGION	2	0.13	0.06	3.22		0.05
YEAR*TREETYPE	4	0.48	0.12	5.92		0.00
YEAR*REGION*TREETYPE	4	0.22	0.06	2.75		0.04
ERROR(YEAR)	48	0.97	0.02			

Huynh-Feldt Epsilon = 0.9078

* Huynh-Feldt

Table 35. Least squares means for Golden-crowned Kinglet densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				*
NORTH ASPEN	0.00	0.00	0.00	
NORTH CONIFER	1.03	0.56	0.48	
NORTH MIXED	0.03	0.00	0.00	
SOUTH ASPEN	0.01	0.00	0.00	
SOUTH CONIFER	1.18	0.73	1.16	
SOUTH MIXED	0.28	0.11	0.21	
REGION				*
NORTH	0.35	0.19	0.16	
SOUTH	0.49	0.28	0.46	
TREETYPE				**
ASPEN	0.00	0.00	0.00	
CONIFER	1.11	0.65	0.82	
MIXED	0.16	0.06	0.10	
TOTAL	0.42	0.23	0.31	**

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				**
NORTH	0.00	0.69	0.01	
SOUTH	0.00	1.02	0.20	
TOTAL	0.00	0.86	0.11	**

REGION		**
NORTH	0.23	
SOUTH	0.41	
TOTAL	0.32	

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 36. Repeated measures analysis of variance table for Gray Jay densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.00	0.00	0.05	0.82	
TREETYPE	2	2.13	1.06	51.21	0.00	
REGION*TREETYPE	2	0.02	0.01	0.44	0.65	
ERROR(PLOT)	24	0.50	0.02			
YEAR	2	0.03	0.01	1.23		0.30
YEAR*REGION	2	0.04	0.02	1.70		0.19
YEAR*TREETYPE	4	0.07	0.02	1.48		0.22
YEAR*REGION*TREETYPE	4	0.05	0.01	1.13		0.35
ERROR(YEAR)	48	0.54	0.01			

Huynh-Feldt Epsilon = 1.1109

* Huynh-Feldt

Table 37. Least squares means for Gray Jay densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR		
	1987	1988	1989
REGION*TREETYPE			
NORTH ASPEN	0.00	0.00	0.00
NORTH CONIFER	0.41	0.30	0.39
NORTH MIXED	0.06	0.10	0.05
SOUTH ASPEN	0.00	0.00	0.00
SOUTH CONIFER	0.30	0.39	0.58
SOUTH MIXED	0.01	0.07	0.04
REGION			
NORTH	0.16	0.14	0.15
SOUTH	0.10	0.15	0.21
TREETYPE			
ASPEN	0.00	0.00	0.00
CONIFER	0.35	0.35	0.48
MIXED	0.04	0.08	0.05
TOTAL	0.13	0.14	0.18

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.00	0.37	0.07	
SOUTH	0.00	0.42	0.04	
TOTAL	0.00	0.40	0.06	**

REGION	
NORTH	0.15
SOUTH	0.15
TOTAL	0.15

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 38. Repeated measures analysis of variance table for Hairy Woodpecker densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.01	0.01	0.44	0.52	
TREETYPE	2	0.02	0.01	0.55	0.58	
REGION*TREETYPE	2	0.06	0.03	2.09	0.15	
ERROR(PLOT)	24	0.35	0.01			
YEAR	2	0.02	0.01	2.25		0.12
YEAR*REGION	2	0.01	0.01	1.17		0.32
YEAR*TREETYPE	4	0.01	0.00	0.47		0.76
YEAR*REGION*TREETYPE	4	0.02	0.00	0.82		0.52
ERROR(YEAR)	48	0.25	0.01			

Huynh-Feldt Epsilon = 0.9964

* Huynh-Feldt

Table 39. Least squares means for Hairy Woodpecker densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR		
	1987	1988	1989
REGION*TREETYPE			
NORTH ASPEN	0.08	0.10	0.16
NORTH CONIFER	0.07	0.02	0.05
NORTH MIXED	0.06	0.02	0.09
SOUTH ASPEN	0.04	0.07	0.10
SOUTH CONIFER	0.07	0.17	0.17
SOUTH MIXED	0.06	0.07	0.07
REGION			
NORTH	0.07	0.05	0.10
SOUTH	0.06	0.10	0.11
TREETYPE			
ASPEN	0.06	0.09	0.13
CONIFER	0.07	0.10	0.11
MIXED	0.06	0.04	0.08
TOTAL	0.06	0.07	0.11

	TREETYPE		
	ASPEN	CONIFER	MIXED
REGION			
NORTH	0.11	0.05	0.05
SOUTH	0.07	0.14	0.06
TOTAL	0.09	0.09	0.06

REGION	
NORTH	0.07
SOUTH	0.09
TOTAL	0.08

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 40. Repeated measures analysis of variance table for Hammond's Flycatcher densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.10	0.10	4.70	0.04	
TREETYPE	2	0.31	0.15	7.02	0.00	
REGION*TREETYPE	2	0.05	0.02	1.12	0.34	
ERROR(PLOT)	24	0.53	0.02			
YEAR	2	0.19	0.10	4.22		0.02
YEAR*REGION	2	0.09	0.05	2.08		0.14
YEAR*TREETYPE	4	0.44	0.11	4.87		0.00
YEAR*REGION*TREETYPE	4	0.22	0.06	2.43		0.06
ERROR(YEAR)	48	1.09	0.02			

Huynh-Feldt Epsilon = 1.0275

* Huynh-Feldt

Table 41. Least squares means for Hammond's Flycatcher densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				
NORTH ASPEN	0.09	0.00	0.32	
NORTH CONIFER	0.60	0.06	0.11	
NORTH MIXED	0.01	0.00	0.05	
SOUTH ASPEN	0.00	0.00	0.06	
SOUTH CONIFER	0.20	0.11	0.11	
SOUTH MIXED	0.02	0.00	0.04	
REGION				
NORTH	0.23	0.02	0.16	
SOUTH	0.07	0.04	0.07	
TREETYPE				**
ASPEN	0.05	0.00	0.19	
CONIFER	0.40	0.08	0.11	
MIXED	0.01	0.00	0.05	
TOTAL	0.15	0.03	0.12	*

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.14	0.26	0.02	
SOUTH	0.02	0.14	0.02	
TOTAL	0.08	0.20	0.02	**

REGION		*
NORTH	0.14	
SOUTH	0.06	
TOTAL	0.10	

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 42. Repeated measures analysis of variance table for Hermit Thrush densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.38	0.38	18.96	0.00	
TREETYPE	2	0.32	0.16	7.77	0.00	
REGION*TREETYPE	2	0.02	0.01	0.38	0.69	
ERROR(PLOT)	24	0.49	0.02			
YEAR	2	0.03	0.01	0.69		0.51
YEAR*REGION	2	0.00	0.00	0.03		0.97
YEAR*TREETYPE	4	0.18	0.05	2.09		0.10
YEAR*REGION*TREETYPE	4	0.05	0.01	0.60		0.67
ERROR(YEAR)	48	1.04	0.02			

Huynh-Feldt Epsilon = 0.7511

* Huynh-Feldt

Table 43. Least squares means for Hermit Thrush densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR		
	1987	1988	1989
REGION*TREETYPE			
NORTH ASPEN	0.04	0.04	0.07
NORTH CONIFER	0.19	0.30	0.20
NORTH MIXED	0.15	0.14	0.10
SOUTH ASPEN	0.19	0.20	0.30
SOUTH CONIFER	0.24	0.44	0.34
SOUTH MIXED	0.39	0.32	0.15
REGION			
NORTH	0.13	0.16	0.12
SOUTH	0.27	0.32	0.26
TREETYPE			
ASPEN	0.11	0.12	0.18
CONIFER	0.22	0.37	0.27
MIXED	0.27	0.23	0.13
TOTAL	0.20	0.24	0.19

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.05	0.23	0.13	
SOUTH	0.23	0.34	0.29	
TOTAL	0.14	0.29	0.21	**

REGION		**
NORTH	0.14	
SOUTH	0.29	
TOTAL	0.21	

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 44. Repeated measures analysis of variance table for House Wren densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.25	0.25	0.27	0.61	
TREETYPE	2	165.87	82.93	89.10	0.00	
REGION*TREETYPE	2	10.07	5.03	5.41	0.01	
ERROR(PLOT)	24	22.34	0.93			
YEAR	2	0.96	0.48	1.75		0.18
YEAR*REGION	2	0.11	0.05	0.19		0.82
YEAR*TREETYPE	4	4.86	1.22	4.42		0.00
YEAR*REGION*TREETYPE	4	0.89	0.22	0.81		0.52
ERROR(YEAR)	48	13.21	0.28			

Huynh-Feldt Epsilon = 0.9442

* Huynh-Feldt

Table 45. Least squares means for House Wren densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				
NORTH ASPEN	3.18	4.03	3.02	
NORTH CONIFER	0.01	0.00	0.05	
NORTH MIXED	0.07	0.02	0.02	
SOUTH ASPEN	2.09	3.27	2.73	
SOUTH CONIFER	0.34	0.02	0.04	
SOUTH MIXED	1.02	0.95	1.02	
REGION				
NORTH	1.09	1.35	1.03	
SOUTH	1.15	1.41	1.26	
TREETYPE				**
ASPEN	2.63	3.65	2.88	
CONIFER	0.17	0.01	0.04	
MIXED	0.55	0.49	0.52	
TOTAL	1.12	1.38	1.15	

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				**
NORTH	3.41	0.02	0.04	
SOUTH	2.70	0.13	1.00	
TOTAL	3.05	0.08	0.52	**

REGION	
NORTH	1.16
SOUTH	1.28
TOTAL	1.22

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 46. Repeated measures analysis of variance table for Lincoln's Sparrow densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	2.30	2.30	2.39	0.14	
TREETYPE	2	31.01	15.50	16.10	0.00	
REGION*TREETYPE	2	1.84	0.92	0.95	0.40	
ERROR(PLOT)	24	23.11	0.96			
YEAR	2	1.07	0.54	4.82		0.01
YEAR*REGION	2	2.17	1.08	9.77		0.00
YEAR*TREETYPE	4	2.27	0.57	5.10		0.00
YEAR*REGION*TREETYPE	4	1.29	0.32	2.91		0.03
ERROR(YEAR)	48	5.33	0.11			

Huynh-Feldt Epsilon = 1.1633

* Huynh-Feldt

Table 47. Least squares means for Lincoln's Sparrow densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				*
NORTH ASPEN	0.93	1.80	0.94	
NORTH CONIFER	0.04	0.35	0.05	
NORTH MIXED	0.05	0.07	0.12	
SOUTH ASPEN	1.10	1.62	2.30	
SOUTH CONIFER	0.01	0.02	0.05	
SOUTH MIXED	0.82	0.47	1.23	
REGION				**
NORTH	0.34	0.74	0.37	
SOUTH	0.64	0.70	1.19	
TREETYPE				**
ASPEN	1.01	1.71	1.62	
CONIFER	0.02	0.19	0.05	
MIXED	0.44	0.27	0.67	
TOTAL	0.49	0.72	0.78	**

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	1.22	0.15	0.08	
SOUTH	1.67	0.03	0.84	
TOTAL	1.45	0.09	0.46	**

REGION	
NORTH	0.48
SOUTH	0.85
TOTAL	0.66

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 48. Repeated measures analysis of variance table for MacGillivary's Warbler densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.01	0.01	0.44	0.51	
TREETYPE	2	0.79	0.39	15.49	0.00	
REGION*TREETYPE	2	0.00	0.00	0.09	0.91	
ERROR(PLOT)	24	0.61	0.03			
YEAR	2	0.03	0.01	1.36		0.27
YEAR*REGION	2	0.03	0.01	1.23		0.30
YEAR*TREETYPE	4	0.04	0.01	1.00		0.42
YEAR*REGION*TREETYPE	4	0.09	0.02	1.96		0.12
ERROR(YEAR)	48	0.53	0.01			

Huynh-Feldt Epsilon = 0.9892

* Huynh-Feldt

Table 49. Least squares means for MacGillivray's Warbler densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR		
	1987	1988	1989
REGION*TREETYPE			
NORTH ASPEN	0.14	0.33	0.10
NORTH CONIFER	0.01	0.00	0.00
NORTH MIXED	0.02	0.03	0.00
SOUTH ASPEN	0.17	0.22	0.29
SOUTH CONIFER	0.00	0.01	0.01
SOUTH MIXED	0.04	0.08	0.03
REGION			
NORTH	0.05	0.12	0.03
SOUTH	0.07	0.10	0.11
TREETYPE			
ASPEN	0.16	0.28	0.19
CONIFER	0.00	0.00	0.00
MIXED	0.03	0.05	0.02
TOTAL	0.06	0.11	0.07

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.19	0.00	0.02	
SOUTH	0.23	0.01	0.05	
TOTAL	0.21	0.00	0.03	**

REGION	
NORTH	0.07
SOUTH	0.09
TOTAL	0.08

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 50. Repeated measures analysis of variance table for Mountain Chickadee densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.01	0.01	0.19	0.66	
TREETYPE	2	25.41	12.70	188.37	0.00	
REGION*TREETYPE	2	1.48	0.74	10.99	0.00	
ERROR(PLOT)	24	1.62	0.07			
YEAR	2	3.58	1.79	34.81		0.00
YEAR*REGION	2	0.29	0.14	2.82		0.07
YEAR*TREETYPE	4	2.81	0.70	13.65		0.00
YEAR*REGION*TREETYPE	4	0.10	0.02	0.48		0.75
ERROR(YEAR)	48	2.47	0.05			

Huynh-Feldt Epsilon = 1.0285

* Huynh-Feldt

Table 51. Least squares means for Mountain Chickadee densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				
NORTH ASPEN	0.32	0.06	0.22	
NORTH CONIFER	1.40	1.40	2.23	
NORTH MIXED	0.67	0.46	0.96	
SOUTH ASPEN	0.09	0.09	0.22	
SOUTH CONIFER	0.67	1.10	2.04	
SOUTH MIXED	1.01	0.95	1.33	
REGION				
NORTH	0.80	0.64	1.14	
SOUTH	0.59	0.71	1.20	
TREETYPE				**
ASPEN	0.21	0.08	0.22	
CONIFER	1.04	1.25	2.14	
MIXED	0.84	0.70	1.15	
TOTAL	0.69	0.68	1.17	**

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				**
NORTH	0.20	1.68	0.70	
SOUTH	0.13	1.27	1.09	
TOTAL	0.17	1.47	0.90	**

REGION	
NORTH	0.86
SOUTH	0.83
TOTAL	0.85

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 52. Repeated measures analysis of variance table for Northern Flicker densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.06	0.06	4.01	0.06	
TREETYPE	2	0.17	0.08	5.80	0.01	
REGION*TREETYPE	2	0.03	0.02	1.17	0.33	
ERROR(PLOT)	24	0.34	0.01			
YEAR	2	0.11	0.05	5.05		0.01
YEAR*REGION	2	0.05	0.03	2.54		0.09
YEAR*TREETYPE	4	0.09	0.02	2.07		0.10
YEAR*REGION*TREETYPE	4	0.05	0.01	1.25		0.30
ERROR(YEAR)	48	0.51	0.01			

Huynh-Feldt Epsilon = 1.0138

* Huynh-Feldt

Table 53. Least squares means for Northern Flicker densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				
NORTH ASPEN	0.21	0.16	0.14	
NORTH CONIFER	0.03	0.03	0.00	
NORTH MIXED	0.40	0.15	0.02	
SOUTH ASPEN	0.09	0.14	0.08	
SOUTH CONIFER	0.04	0.03	0.01	
SOUTH MIXED	0.11	0.07	0.05	
REGION				
NORTH	0.21	0.11	0.05	
SOUTH	0.08	0.08	0.05	
TREETYPE				
ASPEN	0.15	0.15	0.11	
CONIFER	0.04	0.03	0.01	
MIXED	0.25	0.11	0.03	
TOTAL	0.15	0.10	0.05	**

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.17	0.02	0.19	
SOUTH	0.10	0.03	0.07	
TOTAL	0.13	0.03	0.13	**

REGION	
NORTH	0.13
SOUTH	0.07
TOTAL	0.10

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 54. Repeated measures analysis of variance table for Olive-sided Flycatcher densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.16	0.16	3.88	0.06	
TREETYPE	2	2.81	1.40	34.72	0.00	
REGION*TREETYPE	2	0.36	0.18	4.50	0.02	
ERROR(PLOT)	24	0.97	0.04			
YEAR	2	0.06	0.03	0.38		0.69
YEAR*REGION	2	0.13	0.07	0.91		0.41
YEAR*TREETYPE	4	0.11	0.03	0.39		0.82
YEAR*REGION*TREETYPE	4	0.19	0.05	0.65		0.63
ERROR(YEAR)	48	3.55	0.07			

Huynh-Feldt Epsilon = 1.0258

* Huynh-Feldt

Table 55. Least squares means for Olive-sided Flycatcher densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR		
	1987	1988	1989
REGION*TREETYPE			
NORTH ASPEN	0.01	0.00	0.00
NORTH CONIFER	0.51	0.80	0.51
NORTH MIXED	0.00	0.00	0.00
SOUTH ASPEN	0.00	0.00	0.02
SOUTH CONIFER	0.14	0.23	0.51
SOUTH MIXED	0.03	0.00	0.04
REGION			
NORTH	0.17	0.27	0.17
SOUTH	0.06	0.08	0.19
TREETYPE			
ASPEN	0.01	0.00	0.01
CONIFER	0.33	0.51	0.51
MIXED	0.01	0.00	0.02
TOTAL	0.12	0.17	0.18

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				*
NORTH	0.01	0.60	0.00	
SOUTH	0.01	0.29	0.02	
TOTAL	0.01	0.45	0.01	**

REGION	
NORTH	0.20
SOUTH	0.11
TOTAL	0.16

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 56. Repeated measures analysis of variance table for Orange-crowned Warbler densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.25	0.25	1.78	0.19	
TREETYPE	2	1.34	0.67	4.79	0.02	
REGION*TREETYPE	2	0.80	0.40	2.87	0.08	
ERROR(PLOT)	24	3.35	0.14			
YEAR	2	0.04	0.02	1.45		0.24
YEAR*REGION	2	0.10	0.05	3.28		0.05
YEAR*TREETYPE	4	0.12	0.03	2.12		0.09
YEAR*REGION*TREETYPE	4	0.16	0.04	2.74		0.04
ERROR(YEAR)	48	0.71	0.01			

Huynh-Feldt Epsilon = 0.9449

* Huynh-Feldt

Table 57. Least squares means for Orange-crowned Warbler densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				*
NORTH ASPEN	0.28	0.66	0.59	
NORTH CONIFER	0.01	0.04	0.04	
NORTH MIXED	0.13	0.10	0.20	
SOUTH ASPEN	0.16	0.10	0.15	
SOUTH CONIFER	0.05	0.02	0.01	
SOUTH MIXED	0.17	0.17	0.14	
REGION				*
NORTH	0.14	0.27	0.28	
SOUTH	0.13	0.10	0.10	
TREETYPE				
ASPEN	0.22	0.38	0.37	
CONIFER	0.03	0.03	0.02	
MIXED	0.15	0.13	0.17	
TOTAL	0.13	0.18	0.19	

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.51	0.03	0.14	
SOUTH	0.14	0.03	0.16	
TOTAL	0.33	0.03	0.15	*

REGION	
NORTH	0.23
SOUTH	0.11
TOTAL	0.17

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 58. Repeated measures analysis of variance table for Pine Grosbeak densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.04	0.04	66.77	0.00	
TREETYPE	2	0.39	0.20	308.76	0.00	
REGION*TREETYPE	2	0.04	0.02	34.44	0.00	
ERROR(PLOT)	24	0.02	0.00			
YEAR	2	0.02	0.01	3.40		0.04
YEAR*REGION	2	0.00	0.00	0.32		0.72
YEAR*TREETYPE	4	0.02	0.00	1.82		0.14
YEAR*REGION*TREETYPE	4	0.01	0.00	1.30		0.28
ERROR(YEAR)	48	0.12	0.00			

Huynh-Feldt Epsilon = 0.9038

* Huynh-Feldt

Table 59. Least squares means for Pine Grosbeak densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				
NORTH ASPEN	0.00	0.00	0.00	
NORTH CONIFER	0.10	0.04	0.19	
NORTH MIXED	0.01	0.00	0.00	
SOUTH ASPEN	0.01	0.00	0.00	
SOUTH CONIFER	0.24	0.21	0.24	
SOUTH MIXED	0.02	0.01	0.06	
REGION				
NORTH	0.04	0.01	0.06	
SOUTH	0.09	0.07	0.10	
TREETYPE				
ASPEN	0.00	0.00	0.00	
CONIFER	0.17	0.12	0.21	
MIXED	0.02	0.01	0.03	
TOTAL	0.06	0.04	0.08	*

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				**
NORTH	0.00	0.11	0.00	
SOUTH	0.00	0.23	0.03	
TOTAL	0.00	0.17	0.02	**

REGION		**
NORTH	0.04	
SOUTH	0.09	
TOTAL	0.06	

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 60. Repeated measures analysis of variance table for Pine Siskin densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	3.56	3.56	1.33	0.26	
TREETYPE	2	170.75	85.37	31.80	0.00	
REGION*TREETYPE	2	9.71	4.85	1.81	0.19	
ERROR(PLOT)	24	64.43	2.68			
YEAR	2	10.35	5.18	4.17		0.02
YEAR*REGION	2	7.98	3.99	3.21		0.05
YEAR*TREETYPE	4	78.16	19.54	15.73		0.00
YEAR*REGION*TREETYPE	4	75.33	18.83	15.16		0.00
ERROR(YEAR)	48	59.62	1.24			

Huynh-Feldt Epsilon = 0.9414

* Huynh-Feldt

Table 61. Least squares means for Pine Siskin densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				**
NORTH ASPEN	0.87	0.53	0.09	
NORTH CONIFER	3.21	1.98	8.43	
NORTH MIXED	1.49	7.23	0.48	
SOUTH ASPEN	0.78	1.09	0.48	
SOUTH CONIFER	2.49	3.97	2.95	
SOUTH MIXED	3.52	3.12	1.81	
REGION				*
NORTH	1.85	3.25	3.00	
SOUTH	2.26	2.73	1.75	
TREETYPE				**
ASPEN	0.82	0.81	0.29	
CONIFER	2.85	2.98	5.69	
MIXED	2.50	5.18	1.14	
TOTAL	2.06	2.99	2.37	*

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.49	4.54	3.06	
SOUTH	0.78	3.14	2.82	
TOTAL	0.64	3.84	2.94	**

REGION	
NORTH	2.70
SOUTH	2.25
TOTAL	2.47

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 62. Repeated measures analysis of variance table for Purple Martin densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.04	0.04	1.34	0.26	
TREETYPE	2	0.09	0.04	1.51	0.24	
REGION*TREETYPE	2	0.08	0.04	1.43	0.26	
ERROR(PLOT)	24	0.70	0.03			
YEAR	2	0.02	0.01	1.58		0.22
YEAR*REGION	2	0.02	0.01	1.60		0.21
YEAR*TREETYPE	4	0.04	0.01	1.51		0.21
YEAR*REGION*TREETYPE	4	0.04	0.01	1.53		0.21
ERROR(YEAR)	48	0.32	0.01			

Huynh-Feldt Epsilon = 0.9155

* Huynh-Feldt

Table 63. Least squares means for Purple Martin densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR		
	1987	1988	1989
REGION*TREETYPE			
NORTH ASPEN	0.00	0.01	0.00
NORTH CONIFER	0.00	0.00	0.00
NORTH MIXED	0.00	0.00	0.00
SOUTH ASPEN	0.03	0.11	0.25
SOUTH CONIFER	0.00	0.01	0.01
SOUTH MIXED	0.00	0.00	0.02
REGION			
NORTH	0.00	0.00	0.00
SOUTH	0.01	0.04	0.09
TREETYPE			
ASPEN	0.01	0.06	0.13
CONIFER	0.00	0.00	0.00
MIXED	0.00	0.00	0.01
TOTAL	0.00	0.02	0.05

	TREETYPE		
	ASPEN	CONIFER	MIXED
REGION			
NORTH	0.00	0.00	0.00
SOUTH	0.13	0.01	0.01
TOTAL	0.07	0.00	0.00

REGION	
NORTH	0.00
SOUTH	0.05
TOTAL	0.02

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 64. Repeated measures analysis of variance table for Red-breasted Nuthatch densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.08	0.08	9.81	0.00	
TREETYPE	2	1.57	0.79	102.29	0.00	
REGION*TREETYPE	2	0.04	0.02	2.89	0.08	
ERROR(PLOT)	24	0.18	0.01			
YEAR	2	0.02	0.01	1.59		0.21
YEAR*REGION	2	0.03	0.01	2.47		0.09
YEAR*TREETYPE	4	0.02	0.01	0.94		0.45
YEAR*REGION*TREETYPE	4	0.03	0.01	1.34		0.27
ERROR(YEAR)	48	0.28	0.01			

Huynh-Feldt Epsilon = 1.0283

* Huynh-Feldt

Table 65. Least squares means for Red-breasted Nuthatch densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR		
	1987	1988	1989
REGION*TREETYPE			
NORTH ASPEN	0.02	0.01	0.01
NORTH CONIFER	0.31	0.23	0.44
NORTH MIXED	0.34	0.30	0.35
SOUTH ASPEN	0.01	0.01	0.00
SOUTH CONIFER	0.23	0.27	0.23
SOUTH MIXED	0.24	0.21	0.22
REGION			
NORTH	0.22	0.18	0.27
SOUTH	0.16	0.16	0.15
TREETYPE			
ASPEN	0.02	0.01	0.01
CONIFER	0.27	0.25	0.34
MIXED	0.29	0.25	0.28
TOTAL	0.19	0.17	0.21

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.01	0.33	0.33	
SOUTH	0.01	0.24	0.22	
TOTAL	0.01	0.29	0.27	**

REGION		**
NORTH	0.22	
SOUTH	0.16	
TOTAL	0.19	

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 66. Repeated measures analysis of variance table for Red Crossbill densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.24	0.24	7.46	0.01	
TREETYPE	2	1.05	0.53	16.20	0.00	
REGION*TREETYPE	2	0.54	0.27	8.38	0.00	
ERROR(PLOT)	24	0.78	0.03			
YEAR	2	0.32	0.16	9.66		0.00
YEAR*REGION	2	0.14	0.07	4.08		0.02
YEAR*TREETYPE	4	0.57	0.14	8.53		0.00
YEAR*REGION*TREETYPE	4	0.36	0.09	5.30		0.00
ERROR(YEAR)	48	0.80	0.02			

Huynh-Feldt Epsilon = 1.1070

* Huynh-Feldt

Table 67. Least squares means for Red Crossbill densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				**
NORTH ASPEN	0.00	0.00	0.01	
NORTH CONIFER	0.09	0.07	0.10	
NORTH MIXED	0.31	0.02	0.11	
SOUTH ASPEN	0.02	0.00	0.01	
SOUTH CONIFER	0.39	0.13	0.89	
SOUTH MIXED	0.28	0.04	0.04	
REGION				*
NORTH	0.14	0.03	0.07	
SOUTH	0.23	0.05	0.31	
TREETYPE				**
ASPEN	0.01	0.00	0.01	
CONIFER	0.24	0.10	0.49	
MIXED	0.30	0.03	0.08	
TOTAL	0.18	0.04	0.19	**

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				**
NORTH	0.00	0.09	0.15	
SOUTH	0.01	0.47	0.12	
TOTAL	0.01	0.28	0.14	**

REGION		**
NORTH	0.08	
SOUTH	0.20	
TOTAL	0.14	

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 68. Repeated measures analysis of variance table for Red-naped Sapsucker densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.01	0.01	1.12	0.30	
TREETYPE	2	0.05	0.02	4.30	0.03	
REGION*TREETYPE	2	0.01	0.01	0.90	0.42	
ERROR(PLOT)	24	0.13	0.01			
YEAR	2	0.00	0.00	0.22		0.81
YEAR*REGION	2	0.01	0.00	1.25		0.30
YEAR*TREETYPE	4	0.01	0.00	0.94		0.45
YEAR*REGION*TREETYPE	4	0.01	0.00	1.20		0.32
ERROR(YEAR)	48	0.10	0.00			

Huynh-Feldt Epsilon = 1.2784

* Huynh-Feldt

Table 69. Least squares means for Red-naped Sapsucker densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR		
	1987	1988	1989
REGION*TREETYPE			
NORTH ASPEN	0.07	0.05	0.10
NORTH CONIFER	0.00	0.00	0.03
NORTH MIXED	0.01	0.00	0.01
SOUTH ASPEN	0.05	0.08	0.07
SOUTH CONIFER	0.07	0.00	0.01
SOUTH MIXED	0.03	0.08	0.05
REGION			
NORTH	0.03	0.02	0.05
SOUTH	0.05	0.05	0.04
TREETYPE			
ASPEN	0.06	0.07	0.08
CONIFER	0.03	0.00	0.02
MIXED	0.02	0.04	0.03
TOTAL	0.04	0.04	0.04

	TREETYPE		
	ASPEN	CONIFER	MIXED
REGION			
NORTH	0.07	0.01	0.01
SOUTH	0.07	0.02	0.05
TOTAL	0.07	0.02	0.03 *

REGION	
NORTH	0.03
SOUTH	0.05
TOTAL	0.04

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 70. Repeated measures analysis of variance table for Ruby-crowned Kinglet densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.42	0.42	1.70	0.20	
TREETYPE	2	19.93	9.96	40.68	0.00	
REGION*TREETYPE	2	2.51	1.25	5.12	0.01	
ERROR(PLOT)	24	5.88	0.24			
YEAR	2	2.39	1.19	7.00		8.16
YEAR*REGION	2	0.63	0.32	2.00		2.16
YEAR*TREETYPE	4	2.02	0.50	6.00		3.45
YEAR*REGION*TREETYPE	4	0.41	0.10	1.00		0.71
ERROR(YEAR)	48	7.02	0.15			

Huynh-Feldt Epsilon = 0.7056

* Huynh-Feldt

Table 71. Least squares means for Ruby-crowned Kinglet densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR		
	1987	1988	1989
REGION*TREETYPE			
NORTH ASPEN	0.05	0.06	0.77
NORTH CONIFER	0.75	1.26	1.70
NORTH MIXED	0.48	0.70	0.76
SOUTH ASPEN	0.04	0.07	0.08
SOUTH CONIFER	0.68	1.52	1.72
SOUTH MIXED	1.39	1.34	1.09
REGION			
NORTH	0.43	0.67	1.08
SOUTH	0.71	0.98	0.96
TREETYPE			
ASPEN	0.04	0.07	0.42
CONIFER	0.72	1.39	1.71
MIXED	0.94	1.02	0.92
TOTAL	0.57	0.82	1.02

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				**
NORTH	0.29	1.24	0.65	
SOUTH	0.06	1.31	1.27	
TOTAL	0.18	1.27	0.96	**

REGION	
NORTH	0.73
SOUTH	0.88
TOTAL	0.80

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 72. Repeated measures analysis of variance table for Steller's Jay densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.01	0.01	4.74	0.04	
TREETYPE	2	0.04	0.02	17.51	0.00	
REGION*TREETYPE	2	0.00	0.00	0.48	0.62	
ERROR(PLOT)	24	0.03	0.00			
YEAR	2	0.00	0.00	5.40		0.01
YEAR*REGION	2	0.00	0.00	3.53		0.04
YEAR*TREETYPE	4	0.01	0.00	4.27		0.00
YEAR*REGION*TREETYPE	4	0.01	0.00	5.51		0.00
ERROR(YEAR)	48	0.02	0.00			

Huynh-Feldt Epsilon = 1.1607

* Huynh-Feldt

Table 73. Least squares means for Steller's Jay densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				**
NORTH ASPEN	0.01	0.03	0.01	
NORTH CONIFER	0.01	0.00	0.05	
NORTH MIXED	0.11	0.05	0.08	
SOUTH ASPEN	0.00	0.00	0.00	
SOUTH CONIFER	0.00	0.02	0.02	
SOUTH MIXED	0.03	0.04	0.08	
REGION				*
NORTH	0.04	0.03	0.05	
SOUTH	0.01	0.02	0.03	
TREETYPE				**
ASPEN	0.01	0.01	0.01	
CONIFER	0.01	0.01	0.03	
MIXED	0.07	0.05	0.08	
TOTAL	0.03	0.02	0.04	**

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.02	0.02	0.08	
SOUTH	0.00	0.01	0.05	
TOTAL	0.01	0.01	0.06	**

REGION		*
NORTH	0.04	
SOUTH	0.02	
TOTAL	0.03	

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 74. Repeated measures analysis of variance table for Swainson's Thrush densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.00	0.00	0.20	0.66	
TREETYPE	2	0.00	0.00	7.97	0.00	
REGION*TREETYPE	2	0.00	0.00	3.00	0.07	
ERROR(PLOT)	24	0.00	0.00			
YEAR	2	0.00	0.00	7.64		0.00
YEAR*REGION	2	0.00	0.00	1.54		0.22
YEAR*TREETYPE	4	0.00	0.00	4.98		0.00
YEAR*REGION*TREETYPE	4	0.00	0.00	1.69		0.17
ERROR(YEAR)	48	0.01	0.00			

Huynh-Feldt Epsilon = 1.0863

* Huynh-Feldt

Table 75. Least squares means for Swainson's Thrush densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				
NORTH ASPEN	0.01	0.00	0.00	
NORTH CONIFER	0.02	0.05	0.00	
NORTH MIXED	0.01	0.00	0.00	
SOUTH ASPEN	0.02	0.00	0.00	
SOUTH CONIFER	0.01	0.02	0.00	
SOUTH MIXED	0.01	0.01	0.00	
REGION				
NORTH	0.01	0.02	0.00	
SOUTH	0.02	0.01	0.00	
TREETYPE				**
ASPEN	0.01	0.00	0.00	
CONIFER	0.02	0.04	0.00	
MIXED	0.01	0.01	0.00	
TOTAL	0.01	0.01	0.00	**

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.00	0.03	0.00	
SOUTH	0.01	0.01	0.01	
TOTAL	0.00	0.02	0.01	**

REGION	
NORTH	0.01
SOUTH	0.01
TOTAL	0.01

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 76. Repeated measures analysis of variance table for Three-toed Woodpecker densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.00	0.00	0.36	0.56	
TREETYPE	2	0.07	0.04	6.92	0.00	
REGION*TREETYPE	2	0.01	0.01	1.40	0.27	
ERROR(PLOT)	24	0.12	0.01			
YEAR	2	0.02	0.01	4.05		0.02
YEAR*REGION	2	0.07	0.04	16.81		0.00
YEAR*TREETYPE	4	0.02	0.01	2.69		0.04
YEAR*REGION*TREETYPE	4	0.06	0.01	6.44		0.00
ERROR(YEAR)	48	0.11	0.00			

Huynh-Feldt Epsilon = 0.7711

* Huynh-Feldt

Table 77. Least squares means for Three-toed Woodpecker densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				**
NORTH ASPEN	0.00	0.00	0.00	
NORTH CONIFER	0.07	0.15	0.03	
NORTH MIXED	0.03	0.00	0.00	
SOUTH ASPEN	0.00	0.00	0.01	
SOUTH CONIFER	0.05	0.00	0.13	
SOUTH MIXED	0.00	0.00	0.19	
REGION				**
NORTH	0.03	0.05	0.01	
SOUTH	0.02	0.00	0.11	
TREETYPE				*
ASPEN	0.00	0.00	0.00	
CONIFER	0.06	0.08	0.08	
MIXED	0.02	0.00	0.10	
TOTAL	0.02	0.03	0.06	*

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.00	0.08	0.01	
SOUTH	0.00	0.06	0.06	
TOTAL	0.00	0.07	0.04	**

REGION	
NORTH	0.03
SOUTH	0.04
TOTAL	0.04

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 78. Repeated measures analysis of variance table for Townsend's Solitaire densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.00	0.00	1.90	0.18	
TREETYPE	2	0.00	0.00	0.07	0.93	
REGION*TREETYPE	2	0.00	0.00	0.02	0.98	
ERROR(PLOT)	24	0.00	0.00			
YEAR	2	0.00	0.00	1.30		0.28
YEAR*REGION	2	0.00	0.00	1.19		0.31
YEAR*TREETYPE	4	0.00	0.00	1.42		0.24
YEAR*REGION*TREETYPE	4	0.00	0.00	0.47		0.76
ERROR(YEAR)	48	0.00	0.00			

Huynh-Feldt Epsilon = 0.8036

* Huynh-Feldt

Table 79. Least squares means for Townsend's Solitaire densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR		
	1987	1988	1989
REGION*TREETYPE			
NORTH ASPEN	0.00	0.01	0.01
NORTH CONIFER	0.01	0.01	0.00
NORTH MIXED	0.01	0.01	0.00
SOUTH ASPEN	0.00	0.00	0.00
SOUTH CONIFER	0.00	0.00	0.00
SOUTH MIXED	0.00	0.00	0.00
REGION			
NORTH	0.01	0.01	0.00
SOUTH	0.00	0.00	0.00
TREETYPE			
ASPEN	0.00	0.01	0.00
CONIFER	0.01	0.00	0.00
MIXED	0.00	0.01	0.00
TOTAL	0.00	0.01	0.00

	TREETYPE		
	ASPEN	CONIFER	MIXED
REGION			
NORTH	0.01	0.01	0.01
SOUTH	0.00	0.00	0.00
TOTAL	0.00	0.00	0.00

REGION	
NORTH	0.01
SOUTH	0.00
TOTAL	0.00

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 80. Repeated measures analysis of variance table for Tree Swallow densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.01	0.01	0.01	0.92	
TREETYPE	2	7.75	3.88	5.38	0.01	
REGION*TREETYPE	2	1.60	0.80	1.11	0.35	
ERROR(PLOT)	24	17.30	0.72			
YEAR	2	0.84	0.42	4.04		0.02
YEAR*REGION	2	1.03	0.52	4.99		0.01
YEAR*TREETYPE	4	0.36	0.09	0.86		0.49
YEAR*REGION*TREETYPE	4	0.43	0.11	1.03		0.40
ERROR(YEAR)	48	4.97	0.10			

Huynh-Feldt Epsilon = 1.0809

* Huynh-Feldt

Table 81. Least squares means for Tree Swallow densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				
NORTH ASPEN	0.99	0.82	0.83	
NORTH CONIFER	0.04	0.02	0.00	
NORTH MIXED	0.05	0.07	0.14	
SOUTH ASPEN	0.21	0.53	0.98	
SOUTH CONIFER	0.01	0.04	0.06	
SOUTH MIXED	0.07	0.35	0.92	
REGION				**
NORTH	0.36	0.31	0.32	
SOUTH	0.09	0.31	0.65	
TREETYPE				
ASPEN	0.60	0.67	0.91	
CONIFER	0.02	0.03	0.03	
MIXED	0.06	0.21	0.53	
TOTAL	0.23	0.31	0.49	*

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.88	0.02	0.09	
SOUTH	0.57	0.04	0.45	
TOTAL	0.73	0.03	0.27	**

REGION	
NORTH	0.33
SOUTH	0.35
TOTAL	0.34

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 82. Repeated measures analysis of variance table for Violet-green Swallow densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.04	0.04	4.80	0.04	
TREETYPE	2	0.07	0.04	4.10	0.03	
REGION*TREETYPE	2	0.02	0.01	0.91	0.41	
ERROR(PLOT)	24	0.21	0.01			
YEAR	2	0.05	0.03	5.82		0.01
YEAR*REGION	2	0.01	0.01	1.36		0.27
YEAR*TREETYPE	4	0.03	0.01	1.47		0.23
YEAR*REGION*TREETYPE	4	0.01	0.00	0.49		0.74
ERROR(YEAR)	48	0.21	0.00			

Huynh-Feldt Epsilon = 1.2893

* Huynh-Feldt

Table 83. Least squares means for Violet-green Swallow densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				
NORTH ASPEN	0.09	0.01	0.00	
NORTH CONIFER	0.00	0.00	0.00	
NORTH MIXED	0.00	0.00	0.00	
SOUTH ASPEN	0.19	0.09	0.06	
SOUTH CONIFER	0.03	0.04	0.00	
SOUTH MIXED	0.12	0.00	0.00	
REGION				
NORTH	0.03	0.00	0.00	
SOUTH	0.12	0.04	0.02	
TREETYPE				
ASPEN	0.14	0.05	0.03	
CONIFER	0.02	0.02	0.00	
MIXED	0.06	0.00	0.00	
TOTAL	0.07	0.02	0.01	**

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.03	0.00	0.00	
SOUTH	0.12	0.02	0.04	
TOTAL	0.07	0.01	0.02	*

REGION		*
NORTH	0.01	
SOUTH	0.06	
TOTAL	0.04	

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 84. Repeated measures analysis of variance table for Warbling Vireo densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	1.46	1.46	4.71	0.04	
TREETYPE	2	108.12	54.06	174.18	0.00	
REGION*TREETYPE	2	0.33	0.17	0.54	0.59	
ERROR(PLOT)	24	7.45	0.31			
YEAR	2	0.78	0.39	4.85		0.01
YEAR*REGION	2	0.22	0.11	1.37		0.26
YEAR*TREETYPE	4	1.36	0.34	4.23		0.01
YEAR*REGION*TREETYPE	4	0.31	0.08	0.95		0.44
ERROR(YEAR)	48	3.86	0.08			

Huynh-Feldt Epsilon = 1.2663

* Huynh-Feldt

Table 85. Least squares means for Warbling Vireo densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				
NORTH ASPEN	2.27	2.66	2.58	
NORTH CONIFER	0.00	0.00	0.02	
NORTH MIXED	0.59	0.63	0.68	
SOUTH ASPEN	2.28	2.86	3.21	
SOUTH CONIFER	0.10	0.05	0.18	
SOUTH MIXED	1.12	1.00	1.24	
REGION				
NORTH	0.95	1.10	1.09	
SOUTH	1.17	1.30	1.54	
TREETYPE				**
ASPEN	2.27	2.76	2.89	
CONIFER	0.05	0.03	0.10	
MIXED	0.85	0.81	0.96	
TOTAL	1.06	1.20	1.32	**

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	2.50	0.01	0.63	
SOUTH	2.78	0.11	1.12	
TOTAL	2.64	0.06	0.88	**

REGION		*
NORTH	1.05	
SOUTH	1.34	
TOTAL	1.19	

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 86. Repeated measures analysis of variance table for Western Flycatcher densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.01	0.01	0.95	0.34	
TREETYPE	2	0.18	0.09	16.45	0.00	
REGION*TREETYPE	2	0.08	0.04	7.69	0.00	
ERROR(PLOT)	24	0.13	0.01			
YEAR	2	0.01	0.00	0.93		0.40
YEAR*REGION	2	0.03	0.02	5.35		0.01
YEAR*TREETYPE	4	0.02	0.01	1.80		0.14
YEAR*REGION*TREETYPE	4	0.05	0.01	3.78		0.01
ERROR(YEAR)	48	0.15	0.00			

Huynh-Feldt Epsilon = 1.0709

* Huynh-Feldt

Table 87. Least squares means for Western Flycatcher densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				**
NORTH ASPEN	0.02	0.00	0.01	
NORTH CONIFER	0.11	0.17	0.28	
NORTH MIXED	0.00	0.00	0.00	
SOUTH ASPEN	0.01	0.02	0.00	
SOUTH CONIFER	0.14	0.00	0.06	
SOUTH MIXED	0.10	0.07	0.04	
REGION				**
NORTH	0.04	0.06	0.10	
SOUTH	0.08	0.03	0.03	
TREETYPE				
ASPEN	0.01	0.01	0.01	
CONIFER	0.12	0.08	0.17	
MIXED	0.05	0.03	0.02	
TOTAL	0.06	0.04	0.07	

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				**
NORTH	0.01	0.19	0.00	
SOUTH	0.01	0.07	0.07	
TOTAL	0.01	0.13	0.03	**

REGION	
NORTH	0.07
SOUTH	0.05
TOTAL	0.06

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 88. Repeated measures analysis of variance table for Western Tanager densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.02	0.02	0.25	0.62	
TREETYPE	2	0.57	0.29	3.19	0.06	
REGION*TREETYPE	2	0.19	0.09	1.05	0.37	
ERROR(PLOT)	24	2.16	0.09			
YEAR	2	0.10	0.05	3.74		0.03
YEAR*REGION	2	0.53	0.27	19.80		0.00
YEAR*TREETYPE	4	0.14	0.03	2.58		0.05
YEAR*REGION*TREETYPE	4	0.37	0.09	6.86		0.00
ERROR(YEAR)	48	0.65	0.01			

Huynh-Feldt Epsilon = 1.3128

* Huynh-Feldt

Table 89. Least squares means for Western Tanager densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				**
NORTH ASPEN	0.32	0.16	0.33	
NORTH CONIFER	0.42	0.32	0.36	
NORTH MIXED	0.43	0.38	0.17	
SOUTH ASPEN	0.03	0.26	0.07	
SOUTH CONIFER	0.09	0.32	0.57	
SOUTH MIXED	0.20	0.51	0.51	
REGION				**
NORTH	0.39	0.29	0.29	
SOUTH	0.11	0.36	0.38	
TREETYPE				*
ASPEN	0.18	0.21	0.20	
CONIFER	0.26	0.32	0.47	
MIXED	0.31	0.44	0.34	
TOTAL	0.25	0.32	0.34	*

	TREETYPE		
	ASPEN	CONIFER	MIXED
REGION			
NORTH	0.27	0.37	0.32
SOUTH	0.12	0.33	0.41
TOTAL	0.19	0.35	0.36

REGION	
NORTH	0.32
SOUTH	0.29
TOTAL	0.30

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 90. Repeated measures analysis of variance table for Western Wood-pewee densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.42	0.42	0.65	0.43	
TREETYPE	2	10.43	5.22	8.13	0.00	
REGION*TREETYPE	2	0.29	0.15	0.23	0.80	
ERROR(PLOT)	24	15.40	0.64			
YEAR	2	0.69	0.35	4.96		0.01
YEAR*REGION	2	0.26	0.13	1.85		0.17
YEAR*TREETYPE	4	0.25	0.06	0.91		0.47
YEAR*REGION*TREETYPE	4	0.22	0.06	0.80		0.53
ERROR(YEAR)	48	3.35	0.07			

Huynh-Feldt Epsilon = 1.0221

* Huynh-Feldt

Table 91. Least squares means for Western Wood-pewee densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				
NORTH ASPEN	0.78	0.91	0.90	
NORTH CONIFER	0.07	0.23	0.23	
NORTH MIXED	0.01	0.01	0.01	
SOUTH ASPEN	0.54	1.04	1.16	
SOUTH CONIFER	0.17	0.11	0.46	
SOUTH MIXED	0.18	0.44	0.44	
REGION				
NORTH	0.29	0.38	0.38	
SOUTH	0.30	0.53	0.69	
TREETYPE				
ASPEN	0.66	0.98	1.03	
CONIFER	0.12	0.17	0.34	
MIXED	0.09	0.22	0.22	
TOTAL	0.29	0.46	0.53	**

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.86	0.17	0.01	
SOUTH	0.92	0.25	0.35	
TOTAL	0.89	0.21	0.18	**

REGION	
NORTH	0.35
SOUTH	0.50
TOTAL	0.43

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 92. Repeated measures analysis of variance table for White-breasted Nuthatch densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.00	0.00	3.81	0.06	
TREETYPE	2	0.00	0.00	1.04	0.37	
REGION*TREETYPE	2	0.00	0.00	0.74	0.49	
ERROR(PLOT)	24	0.01	0.00			
YEAR	2	0.00	0.00	5.03		0.01
YEAR*REGION	2	0.00	0.00	11.44		0.00
YEAR*TREETYPE	4	0.00	0.00	2.03		0.11
YEAR*REGION*TREETYPE	4	0.00	0.00	3.42		0.02
ERROR(YEAR)	48	0.01	0.00			

Huynh-Feldt Epsilon = 0.9098

* Huynh-Feldt

Table 93. Least squares means for White-breasted Nuthatch densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				*
NORTH ASPEN	0.00	0.00	0.00	
NORTH CONIFER	0.00	0.02	0.00	
NORTH MIXED	0.00	0.01	0.00	
SOUTH ASPEN	0.01	0.01	0.02	
SOUTH CONIFER	0.00	0.00	0.05	
SOUTH MIXED	0.00	0.00	0.01	
REGION				**
NORTH	0.00	0.01	0.00	
SOUTH	0.00	0.01	0.03	
TREETYPE				
ASPEN	0.01	0.00	0.01	
CONIFER	0.00	0.01	0.02	
MIXED	0.00	0.01	0.01	
TOTAL	0.00	0.01	0.01	**

	TREETYPE		
	ASPEN	CONIFER	MIXED
REGION			
NORTH	0.00	0.01	0.00
SOUTH	0.01	0.02	0.01
TOTAL	0.01	0.01	0.01

REGION	
NORTH	0.00
SOUTH	0.01
TOTAL	0.01

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 94. Repeated measures analysis of variance table for White-crowned Sparrow densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	1.34	1.34	4.45	0.05	
TREETYPE	2	1.47	0.73	2.45	0.11	
REGION*TREETYPE	2	0.93	0.47	1.55	0.23	
ERROR(PLOT)	24	7.20	0.30			
YEAR	2	0.09	0.05	3.08		0.06
YEAR*REGION	2	0.09	0.04	2.88		0.07
YEAR*TREETYPE	4	0.05	0.01	0.90		0.47
YEAR*REGION*TREETYPE	4	0.04	0.01	0.63		0.65
ERROR(YEAR)	48	0.71	0.01			

Huynh-Feldt Epsilon = 1.0178

* Huynh-Feldt

Table 95. Least squares means for White-crowned Sparrow densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR		
	1987	1988	1989
REGION*TREETYPE			
NORTH ASPEN	0.06	0.09	0.05
NORTH CONIFER	0.01	0.01	0.02
NORTH MIXED	0.00	0.00	0.00
SOUTH ASPEN	0.46	0.69	0.61
SOUTH CONIFER	0.01	0.01	0.01
SOUTH MIXED	0.15	0.40	0.41
REGION			
NORTH	0.03	0.03	0.02
SOUTH	0.21	0.36	0.35
TREETYPE			
ASPEN	0.26	0.39	0.33
CONIFER	0.01	0.01	0.02
MIXED	0.08	0.20	0.21
TOTAL	0.12	0.20	0.18

	TREETYPE		
	ASPEN	CONIFER	MIXED
REGION			
NORTH	0.07	0.01	0.00
SOUTH	0.59	0.01	0.32
TOTAL	0.33	0.01	0.16

REGION		*
NORTH	0.03	
SOUTH	0.31	
TOTAL	0.17	

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 96. Repeated measures analysis of variance table for White-winged Crossbill densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.04	0.04	4.83	0.04	
TREETYPE	2	0.16	0.08	9.52	0.00	
REGION*TREETYPE	2	0.06	0.03	3.41	0.05	
ERROR(PLOT)	24	0.20	0.01			
YEAR	2	0.14	0.07	8.11		0.00
YEAR*REGION	2	0.11	0.06	6.62		0.00
YEAR*TREETYPE	4	0.20	0.05	6.12		0.00
YEAR*REGION*TREETYPE	4	0.16	0.04	4.87		0.00
ERROR(YEAR)	48	0.40	0.01			

Huynh-Feldt Epsilon = 0.6281

* Huynh-Feldt

Table 97. Least squares means for White-winged Crossbill densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				**
NORTH ASPEN	0.00	0.00	0.00	
NORTH CONIFER	0.00	0.06	0.07	
NORTH MIXED	0.00	0.00	0.00	
SOUTH ASPEN	0.00	0.01	0.00	
SOUTH CONIFER	0.00	0.50	0.02	
SOUTH MIXED	0.00	0.04	0.00	
REGION				**
NORTH	0.00	0.02	0.02	
SOUTH	0.00	0.18	0.01	
TREETYPE				**
ASPEN	0.00	0.00	0.00	
CONIFER	0.00	0.28	0.04	
MIXED	0.00	0.02	0.00	
TOTAL	0.00	0.10	0.01	**

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				*
NORTH	0.00	0.04	0.00	
SOUTH	0.00	0.17	0.01	
TOTAL	0.00	0.11	0.01	**

REGION		*
NORTH	0.01	
SOUTH	0.06	
TOTAL	0.04	

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 98. Repeated measures analysis of variance table for Williamson's Sapsucker densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.00	0.00	1.45	0.24	
TREETYPE	2	0.00	0.00	6.70	0.00	
REGION*TREETYPE	2	0.00	0.00	0.57	0.57	
ERROR(PLOT)	24	0.01	0.00			
YEAR	2	0.00	0.00	7.49		0.00
YEAR*REGION	2	0.00	0.00	0.50		0.61
YEAR*TREETYPE	4	0.01	0.00	8.56		0.00
YEAR*REGION*TREETYPE	4	0.00	0.00	0.63		0.64
ERROR(YEAR)	48	0.01	0.00			

Huynh-Feldt Epsilon = 0.7361

* Huynh-Feldt

Table 99. Least squares means for Williamson's Sapsucker densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				
NORTH ASPEN	0.00	0.00	0.00	
NORTH CONIFER	0.04	0.00	0.00	
NORTH MIXED	0.00	0.00	0.00	
SOUTH ASPEN	0.00	0.00	0.00	
SOUTH CONIFER	0.06	0.00	0.01	
SOUTH MIXED	0.00	0.00	0.02	
REGION				
NORTH	0.01	0.00	0.00	
SOUTH	0.02	0.00	0.01	
TREETYPE				**
ASPEN	0.00	0.00	0.00	
CONIFER	0.05	0.00	0.00	
MIXED	0.00	0.00	0.01	
TOTAL	0.02	0.00	0.00	**

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				
NORTH	0.00	0.01	0.00	
SOUTH	0.00	0.02	0.01	
TOTAL	0.00	0.02	0.00	**

REGION	
NORTH	0.00
SOUTH	0.01
TOTAL	0.01

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 100. Repeated measures analysis of variance table for Wilson's Warbler densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.04	0.04	3.62	0.07	
TREETYPE	2	0.03	0.02	1.50	0.24	
REGION*TREETYPE	2	0.03	0.02	1.55	0.23	
ERROR(PLOT)	24	0.24	0.01			
YEAR	2	0.04	0.02	2.26		0.12
YEAR*REGION	2	0.05	0.03	2.70		0.08
YEAR*TREETYPE	4	0.09	0.02	2.25		0.08
YEAR*REGION*TREETYPE	4	0.09	0.02	2.21		0.08
ERROR(YEAR)	48	0.47	0.01			

Huynh-Feldt Epsilon = 0.6274

* Huynh-Feldt

Table 101. Least squares means for Wilson's Warbler densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR		
	1987	1988	1989
REGION*TREETYPE			
NORTH ASPEN	0.00	0.00	0.00
NORTH CONIFER	0.00	0.01	0.02
NORTH MIXED	0.00	0.01	0.00
SOUTH ASPEN	0.04	0.01	0.02
SOUTH CONIFER	0.00	0.02	0.02
SOUTH MIXED	0.34	0.00	0.00
REGION			
NORTH	0.00	0.00	0.01
SOUTH	0.12	0.01	0.01
TREETYPE			
ASPEN	0.02	0.00	0.01
CONIFER	0.00	0.02	0.02
MIXED	0.17	0.00	0.00
TOTAL	0.06	0.01	0.01

	TREETYPE		
	ASPEN	CONIFER	MIXED
REGION			
NORTH	0.00	0.01	0.00
SOUTH	0.02	0.01	0.11
TOTAL	0.01	0.01	0.06

REGION	
NORTH	0.00
SOUTH	0.05
TOTAL	0.03

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 102. Repeated measures analysis of variance table for Yellow Warbler densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	0.05	0.05	5.59	0.03	
TREETYPE	2	0.09	0.05	5.55	0.01	
REGION*TREETYPE	2	0.07	0.04	4.30	0.03	
ERROR(PLOT)	24	0.20	0.01			
YEAR	2	0.02	0.01	2.71		0.08
YEAR*REGION	2	0.03	0.01	3.19		0.05
YEAR*TREETYPE	4	0.03	0.01	1.76		0.15
YEAR*REGION*TREETYPE	4	0.04	0.01	2.35		0.07
ERROR(YEAR)	48	0.19	0.00			

Huynh-Feldt Epsilon = 0.6892

* Huynh-Feldt

Table 103. Least squares means for Yellow Warbler densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				
NORTH ASPEN	0.02	0.00	0.00	
NORTH CONIFER	0.00	0.00	0.00	
NORTH MIXED	0.00	0.00	0.00	
SOUTH ASPEN	0.05	0.10	0.26	
SOUTH CONIFER	0.00	0.00	0.04	
SOUTH MIXED	0.02	0.00	0.02	
REGION				*
NORTH	0.01	0.00	0.00	
SOUTH	0.02	0.03	0.11	
TREETYPE				
ASPEN	0.04	0.05	0.13	
CONIFER	0.00	0.00	0.02	
MIXED	0.01	0.00	0.01	
TOTAL	0.02	0.02	0.05	

	TREETYPE			
	ASPEN	CONIFER	MIXED	
REGION				*
NORTH	0.01	0.00	0.00	
SOUTH	0.14	0.02	0.01	
TOTAL	0.07	0.01	0.01	**

REGION		*
NORTH	0.00	
SOUTH	0.05	
TOTAL	0.03	

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 104. Repeated measures analysis of variance table for Yellow-rumped Warbler densities in aspen, conifer and mixed tree types in two regions in the Central Rocky Mountains for the years 1987-1989.

SOURCE	DF	TYPE III SS	MS	F	Pr > F	HF* Adj Pr > F
REGION	1	7.99	7.99	16.14	0.00	
TREETYPE	2	3.08	1.54	3.11	0.06	
REGION*TREETYPE	2	0.72	0.36	0.73	0.49	
ERROR(PLOT)	24	11.89	0.50			
YEAR	2	0.86	0.43	2.28		0.11
YEAR*REGION	2	2.37	1.19	6.31		0.00
YEAR*TREETYPE	4	5.47	1.37	7.27		0.00
YEAR*REGION*TREETYPE	4	7.23	1.81	9.61		0.00
ERROR(YEAR)	48	9.02	0.19			

Huynh-Feldt Epsilon = 0.9204

* Huynh-Feldt

Table 105. Least squares means for Yellow-rumped Warbler densities in aspen, conifer and mixed treetypes in two regions in the Central Rocky Mountains for the years 1987-89.

	YEAR			
	1987	1988	1989	
REGION*TREETYPE				**
NORTH ASPEN	1.22	0.78	1.42	
NORTH CONIFER	1.29	1.26	0.61	
NORTH MIXED	1.41	1.60	1.01	
SOUTH ASPEN	1.73	1.76	1.68	
SOUTH CONIFER	0.00	2.29	2.26	
SOUTH MIXED	2.67	2.26	2.06	
REGION				**
NORTH	1.31	1.21	1.01	
SOUTH	1.47	2.11	2.00	
TREETYPE				**
ASPEN	1.48	1.27	1.55	
CONIFER	0.65	1.78	1.43	
MIXED	2.04	1.93	1.54	
TOTAL	1.39	1.66	1.51	

	TREETYPE		
	ASPEN	CONIFER	MIXED
REGION			
NORTH	1.14	1.05	1.34
SOUTH	1.73	1.52	2.33
TOTAL	1.43	1.29	1.84

REGION		**
NORTH	1.18	
SOUTH	1.86	
TOTAL	1.52	

** Indicates significance at .01 level.
* Indicates significance at .05 level.

Table 106. Bird species abundant enough to estimate density, but that occurred in only one of the three treetypes in the avian community response to habitat study in the Central Rocky Mountains, 1987-89.

ASPEN

ALFL Alder Flycatcher
BCHU Black-chinned Hummingbird
BLBW Black-throated Warbler
BRBL Brewer's Blackbird
COGR Common Grosbeak
EUST European Starling
HOFI House Finch
HOSP House Sparrow
MAWA Magnolia Warbler
MOBL Mountain Bluebird
PIWA Pine Warbler
RWBL Red-winged Blackbird
SOSP Song Sparrow
VEER Veery
WEME Western Meadowlark
WIFL Willow Flycatcher

CONIFER

RWSW Rough-winged Swallow

MIXED

BGWA Black-throated Gray Warbler
SOVI Solitary Vireo

Table 107. Habitat selection function estimation for Brown-headed Cowbird in the avian community response to habitat study in the Central Rocky Mountains, 1987-89.

Region: North Treetype: Aspen

VARIABLE	PARAMETER ESTIMATE	STANDARD ERROR	WALD CHI-SQUARE	Pr > CHI-SQUARE
Intercept	2.37	0.70	11.41	< 0.00
CT1D	-13.67	6.86	3.97	0.05
SP1CARE	-10.42	3.81	7.48	< 0.00
SP2LIPO	-12.15	4.42	7.56	< 0.00
CT3G	56.61	20.16	7.88	< 0.00
SP3AMAL	14.46	6.97	4.30	0.04
SP3POTR	-22.02	8.72	6.38	0.01

Region: North Treetype: Conifer

Logistic procedure fit only an intercept term

Region: North Treetype: Mixed

Logistic procedure did not converge

Region: South Treetype: Aspen

VARIABLE	PARAMETER ESTIMATE	STANDARD ERROR	WALD CHI-SQUARE	Pr > CHI-SQUARE
Intercept	0.35	0.27	1.69	0.19
SP2PTAQ	-8.98	3.84	5.48	0.02
SP3SYOR	29.99	11.57	6.72	0.01

Region: South Treetype: Conifer

Logistic procedure did not converge.

Region: South Treetype: Mixed

Logistic procedure did not converge.

Table 108. Habitat selection function estimation for Hermit Thrush in the avian community response to habitat study in the Central Rocky Mountains, 1987-89.

Region: North Treetype: Aspen

VARIABLE	PARAMETER ESTIMATE	STANDARD ERROR	WALD CHI-SQUARE	Pr > CHI-SQUARE
Intercept	.13	.22	3.81	0.05
SP3SYOR	71.05	37.82	3.53	0.06
CT2T	50.32	25.78	3.81	0.05

Region: North Treetype: Conifer

VARIABLE	PARAMETER ESTIMATE	STANDARD ERROR	WALD CHI-SQUARE	Pr > CHI-SQUARE
Intercept	1.60	0.82	3.79	0.05
CT1S	-6.55	3.12	4.40	0.04

Region: North Treetype: Mixed

VARIABLE	PARAMETER ESTIMATE	STANDARD ERROR	WALD CHI-SQUARE	Pr > CHI-SQUARE
Intercept	1.67	0.65	6.68	0.01
SP3POTR	-70.03	27.46	6.51	0.01
SP1ELYM	-49.71	25.01	3.95	0.05

Region: South Treetype: Aspen

VARIABLE	PARAMETER ESTIMATE	STANDARD ERROR	WALD CHI-SQUARE	Pr > CHI-SQUARE
Intercept	-0.90	0.22	17.40	0.00
CT3D	-89.82	36.72	5.98	0.01

Table 108 (cont). Habitat selection function estimation for Hermit Thrush in the avian community response to habitat study in the Central Rocky Mountains, 1987-89.

Region: South Treetype: Conifer

VARIABLE	PARAMETER ESTIMATE	STANDARD ERROR	WALD CHI-SQUARE	Pr > CHI-SQUARE
Intercept	-1.54	0.55	7.93	<0.00
SP2OSOC	88.46	42.25	4.38	0.04
SP2AGRO	55.04	28.75	3.66	0.06

Region: South Treetype: Mixed

Logistic procedure fit only an intercept term

Table 109. Habitat selection function estimation for Western Wood-pewee in the avian community response to habitat study in the Central Rocky Mountains, 1987-89.

Region: North Treetype: Aspen

VARIABLE	PARAMETER ESESTIMATE	STANDARD ERROR	WALD CHI-SQUARE	Pr > CHI-SQUARE
Intercept	-0.29	0.57	0.26	0.61
SP1CARE	-8.67	3.25	7.14	0.01
SP1ELYM	13.77	4.44	0.59	< 0.00

Region: North Treetype: Conifer

Logistic procedure did not converge.

Region: North Treetype: Mixed

VARIABLE	PARAMETER ESTIMATE	STANDARD ERROR	WALD CHI-SQUARE	Pr > CHI-SQUARE
Intercept	-13.86	387.25	0.00	0.97
SP2ELYM	323.64	5679.86	0.00	0.95
CT1S	-419.09	10660.11	0.00	0.97
NW	0.36	628.64	0.00	> 0.99
SW	-4.96	598.26	0.00	0.99
SSW	36.45	1291.72	0.00	0.98
SSE	22.25	442.07	0.00	0.96
SE	-1.36	1519.78	0.00	> 0.99
NOE	-8.78	759.98	0.00	0.99
NNE	-7.08	558.66	0.00	0.99

Region: South Treetype: Aspen

VARIABLE	PARAMETER ESTIMATE	STANDARD ERROR	WALD CHI-SQUARE	Pr > CHI-SQUARE
Intercept	0.30	0.35	0.73	0.39
CT1S	-12.61	5.63	5.02	0.03
CT1R	-58.73	38.74	2.30	0.13
SP1CARE	12.25	5.07	5.85	0.02

Table 109 (cont). Habitat selection function estimation for Western Wood-pewee in the avian community response to habitat study in the Central Rocky Mountains, 1987-89.

Region: South Treetype: Conifer

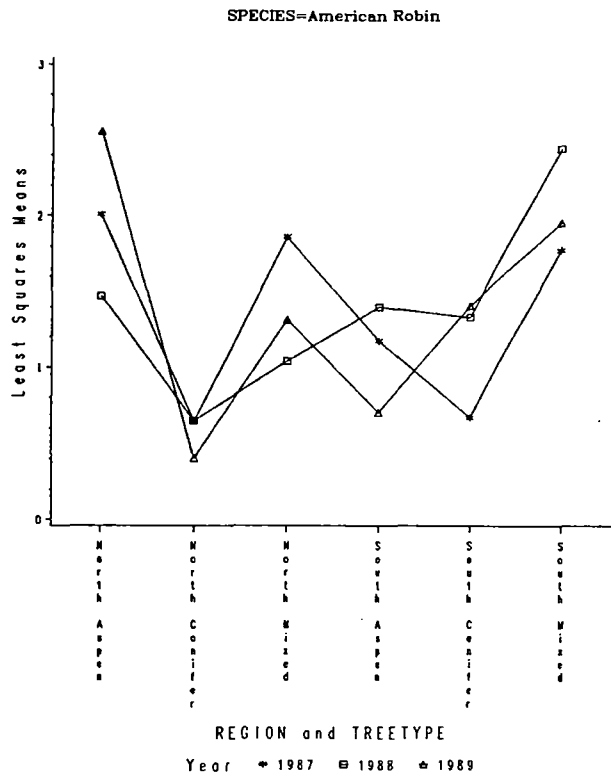
VARIABLE	PARAMETER ESTIMATE	STANDARD ERROR	WALD CHI-SQUARE	Pr > CHI-SQUARE
Intercept	-2.01	0.54	13.64	0.00
SP3POTR	55.69	36.92	2.28	0.13

Region: South Treetype: Mixed

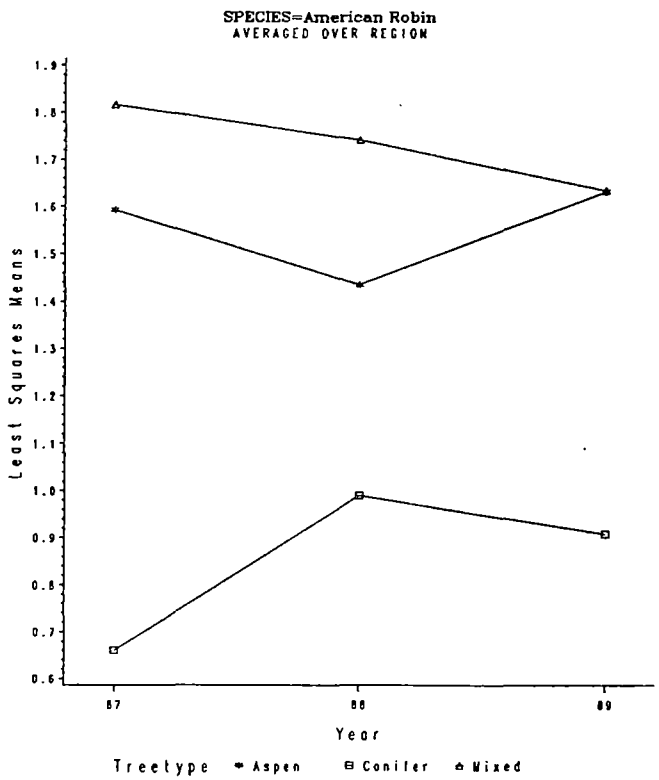
Logistic procedure fit only an intercept term.

Fig. 1. Least squares means for American Robin in 6 habitats.

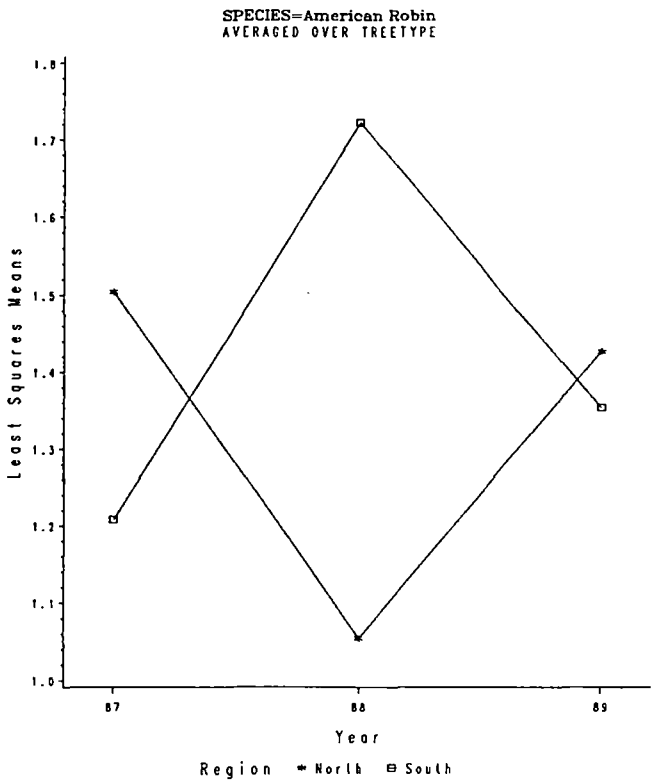
a. Year by region by treetype interaction. (P < 0.00)



b. Year by treetype interaction. (P = 0.43)



c. Year by region interaction. (P < 0.00)



d. Year main effect. (P = 0.96)

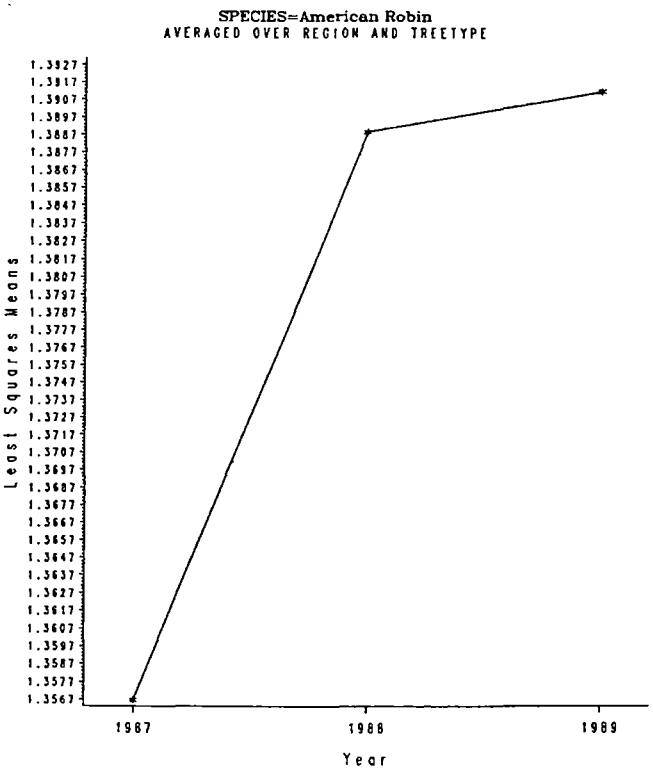
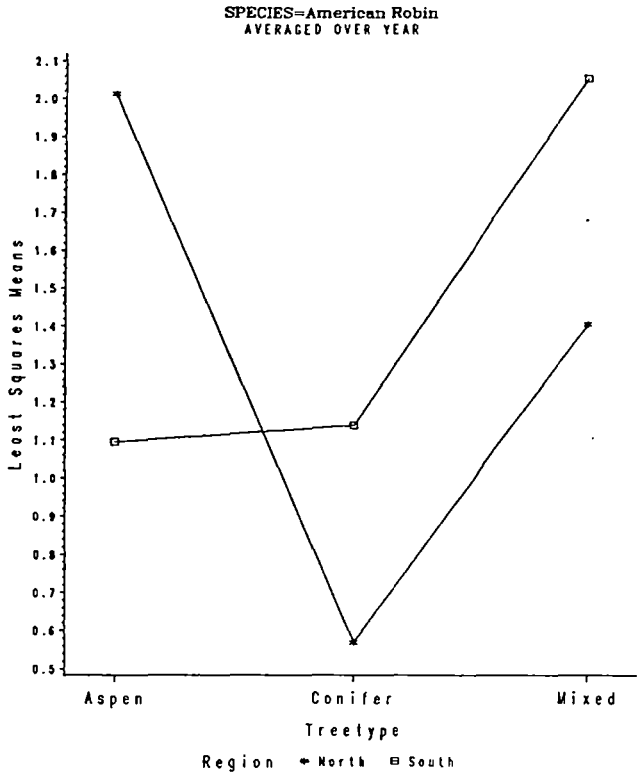
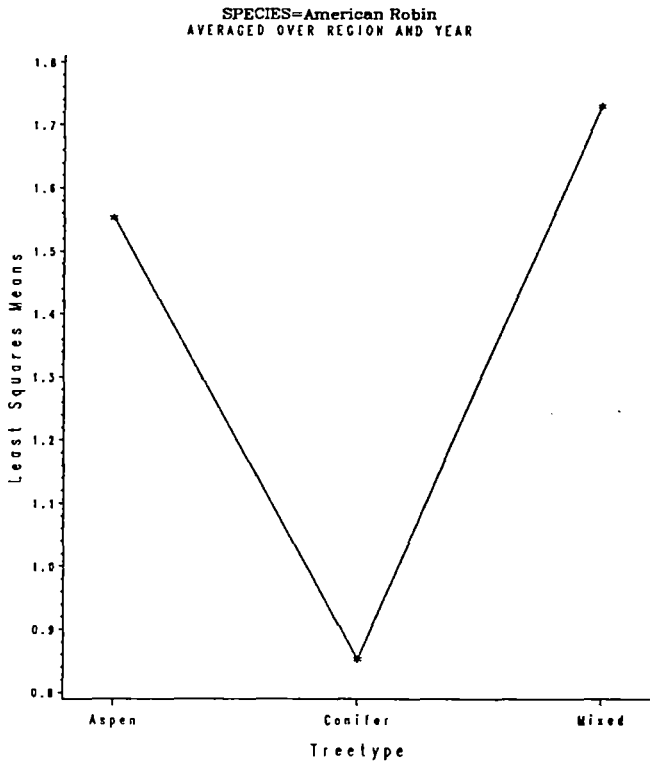


Fig. 1 (cont.).

e. Region by treetype interaction. (P = 0.02)



f. Treetype main effect. (P = 0.07)



g. Region main effect. (P = 0.73)

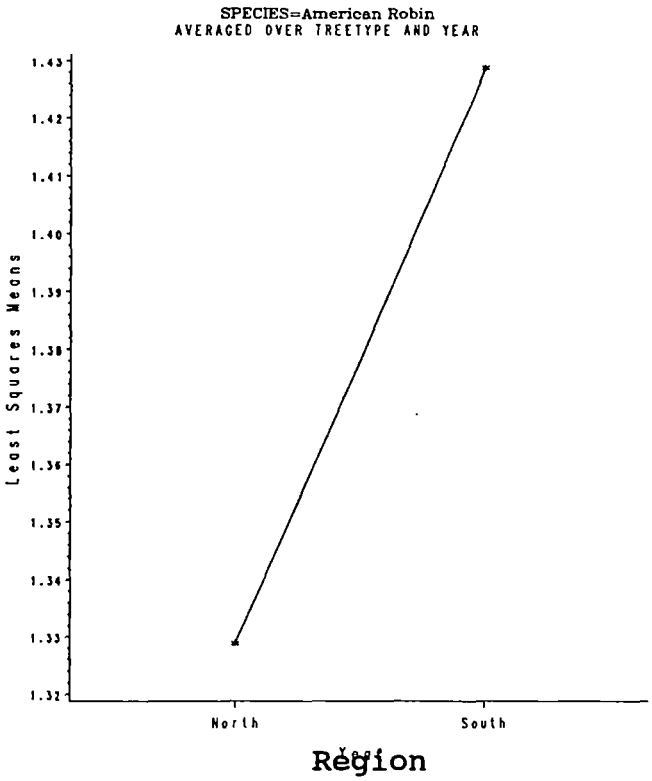
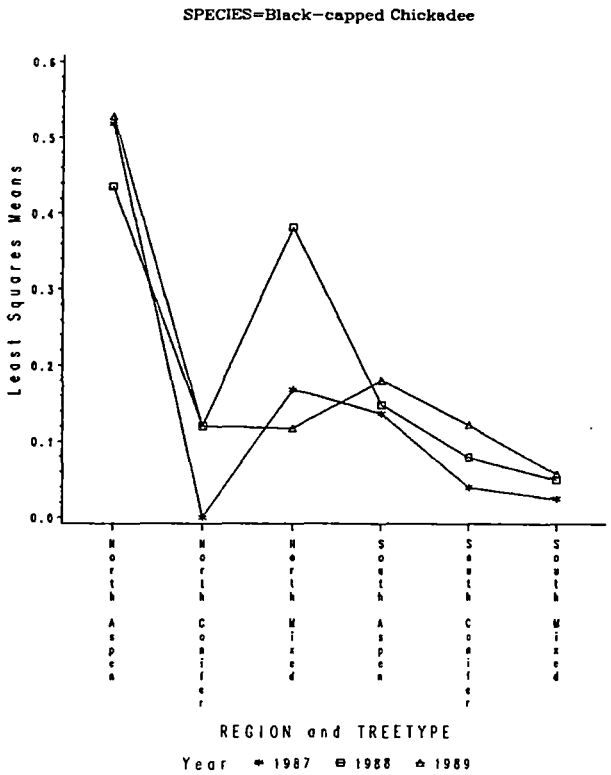
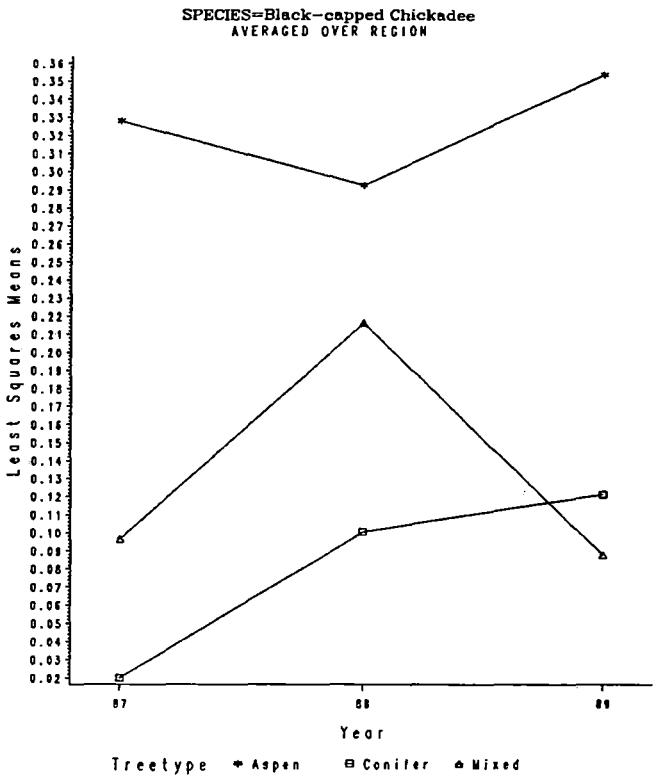
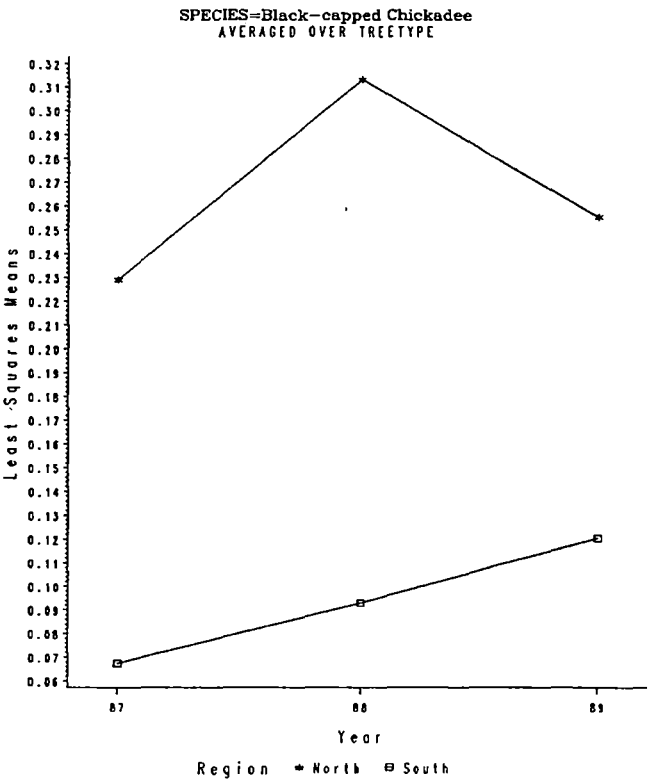
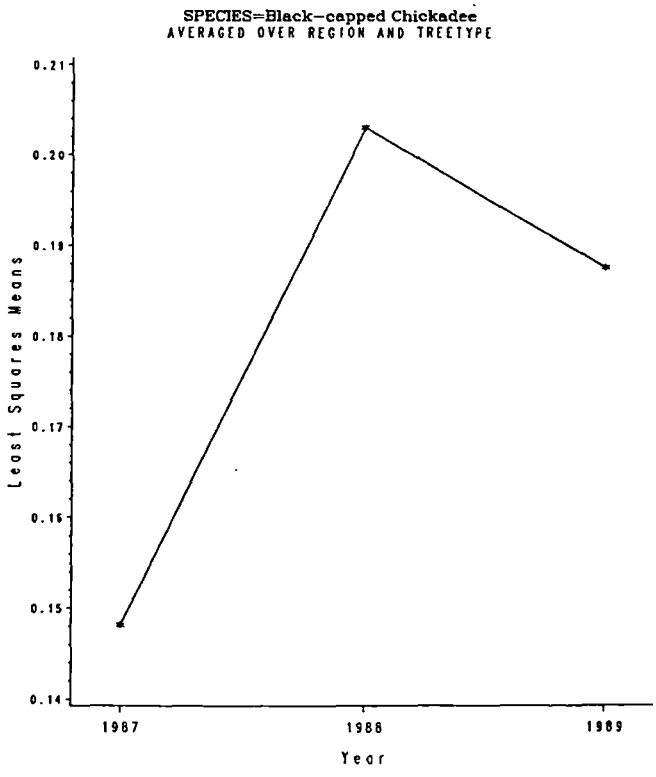


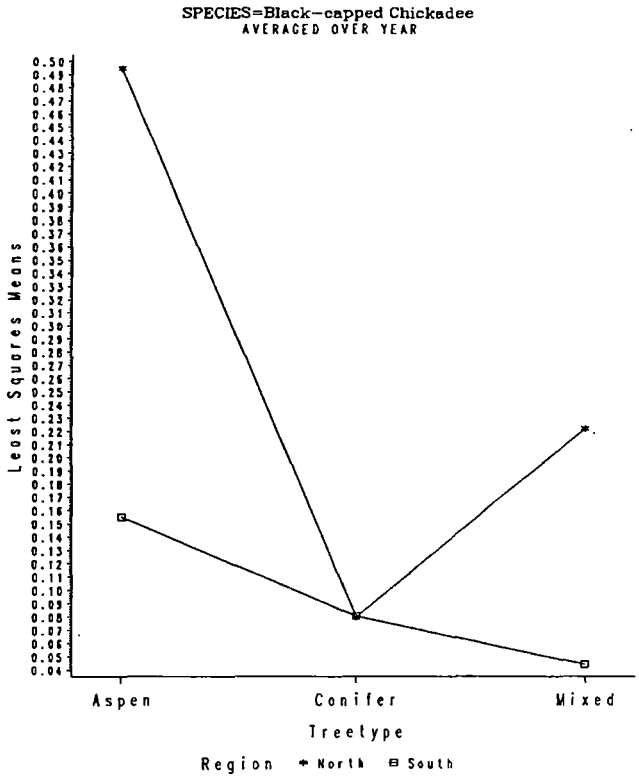
Fig. 2. Least squares means for Black-capped Chickadee in 6 habitats.

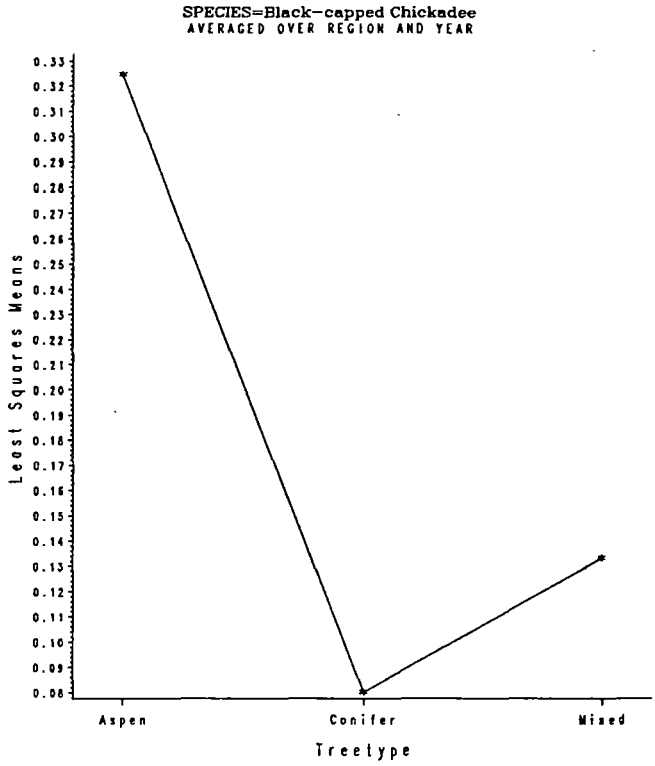









SPECIES=Black-capped Chickadee
AVERAGED OVER YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Black-capped Chickadee
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

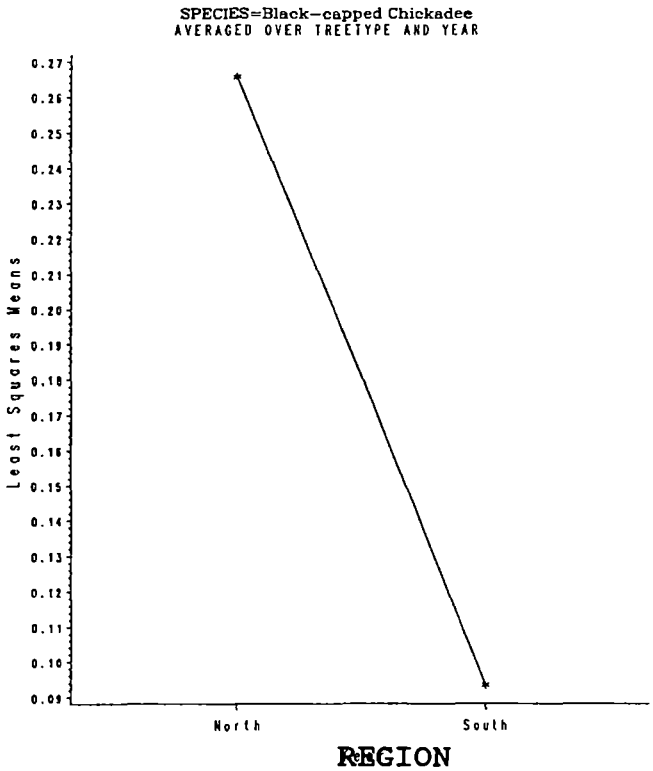
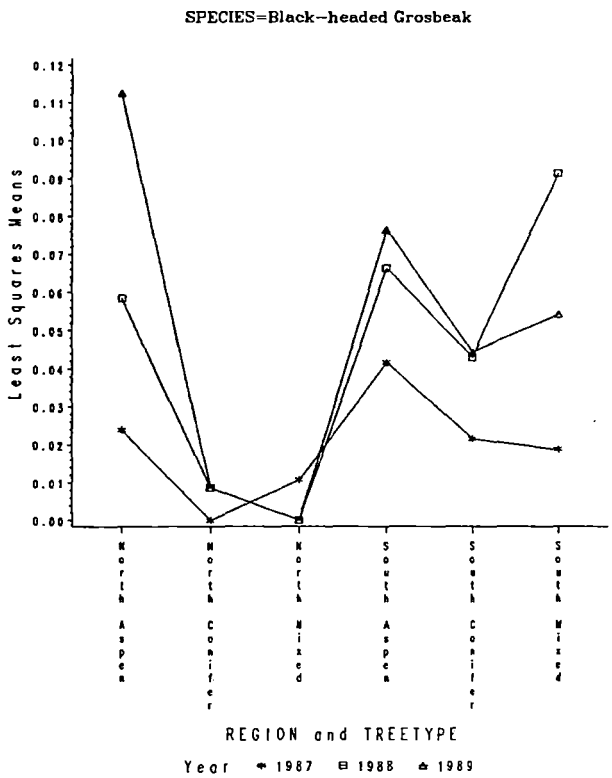
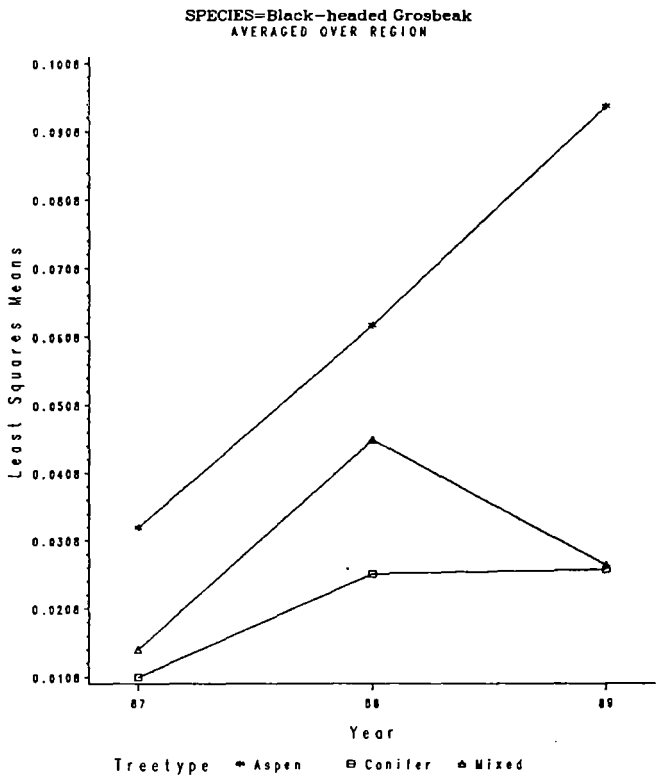
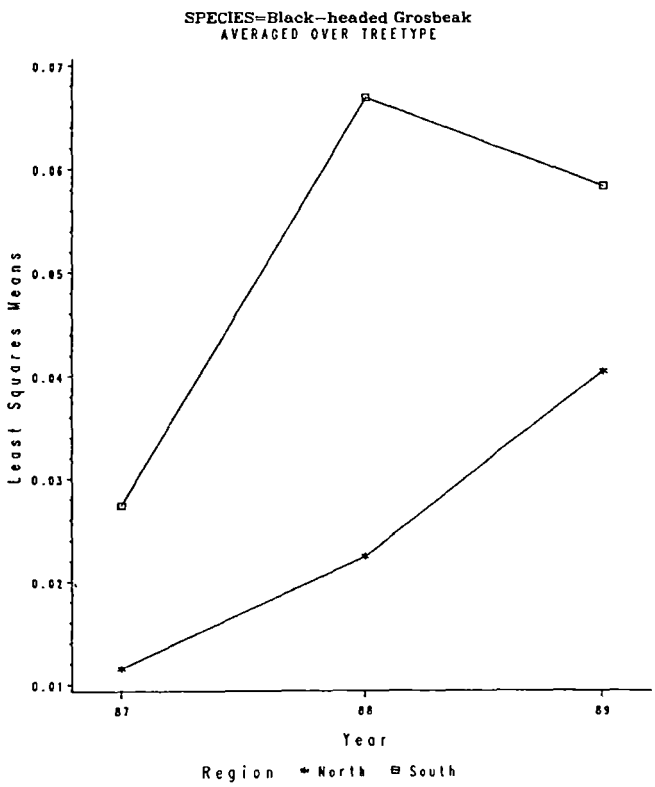
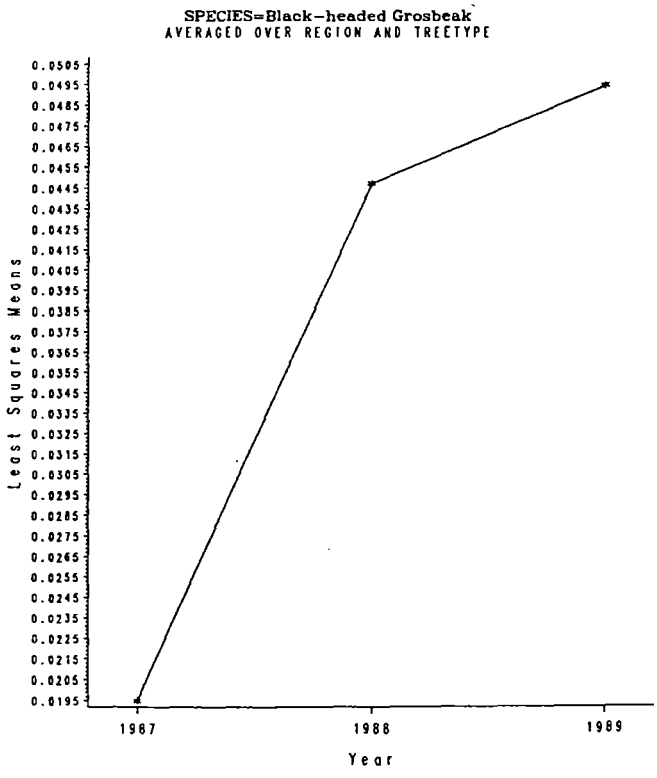

SPECIES=Black-capped Chickadee
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

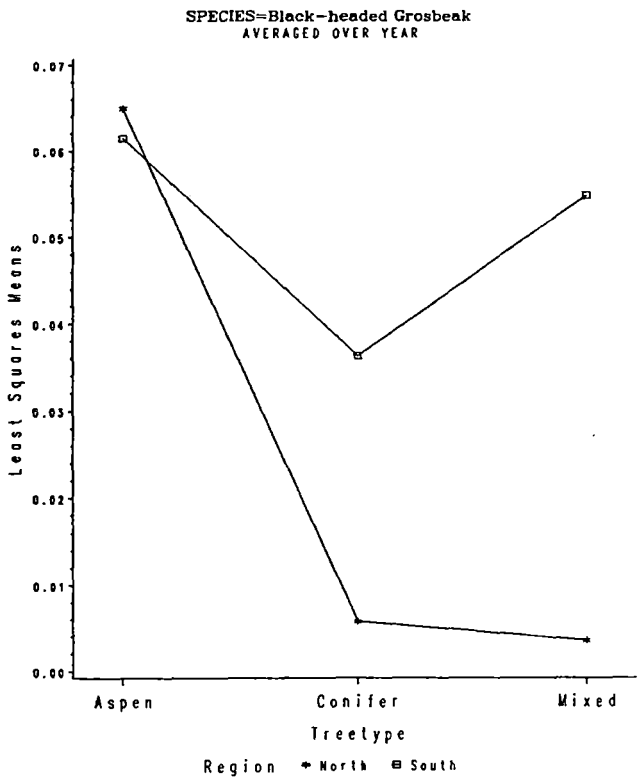
Fig. 3. Least squares means for Black-headed Grosbeak in 6 habitats.

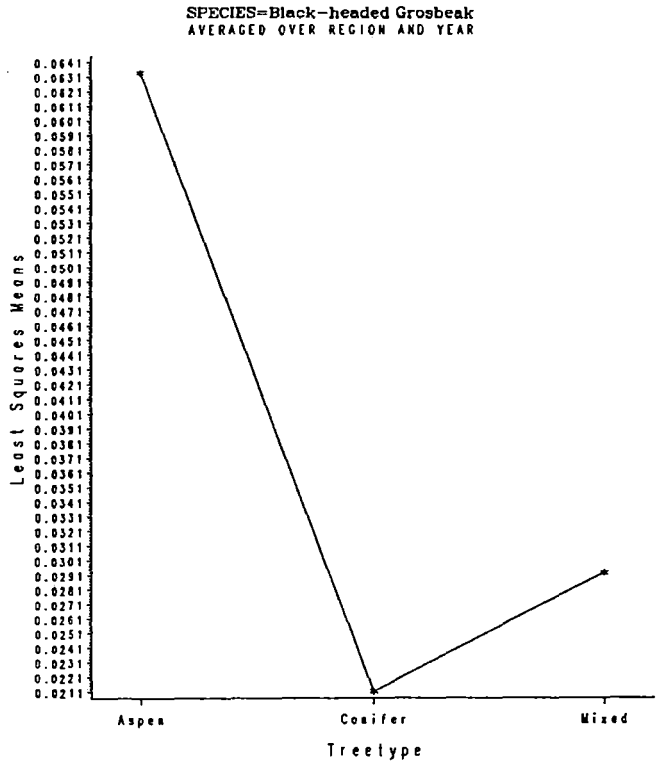









SPECIES=Black-headed Grosbeak
AVERAGED OVER YEAR
Least Squares Means
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Aspen
Conifer
Mixed
Treetype
Region
North
South


SPECIES=Black-headed Grosbeak
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

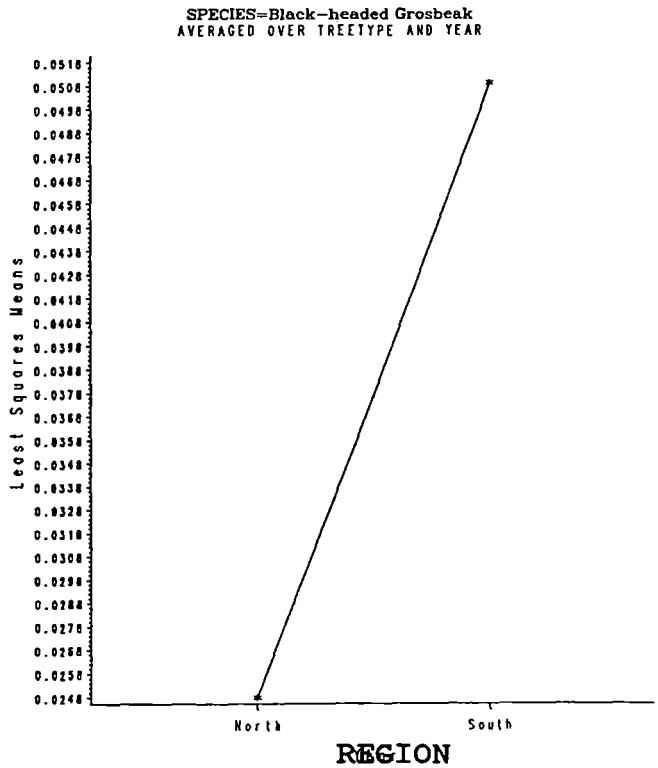
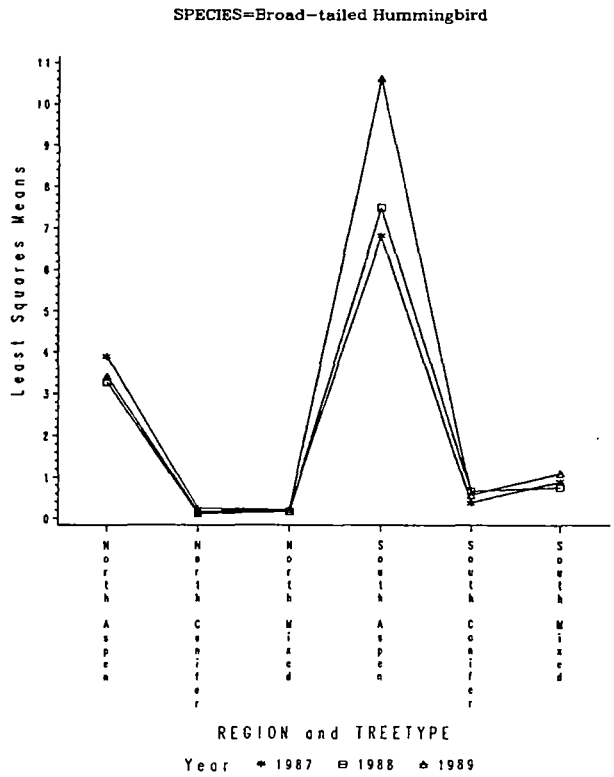
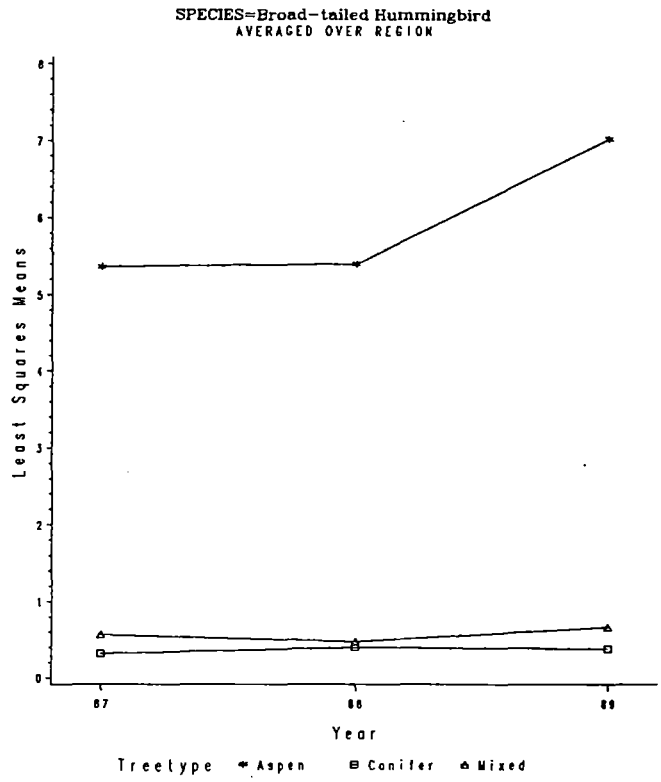
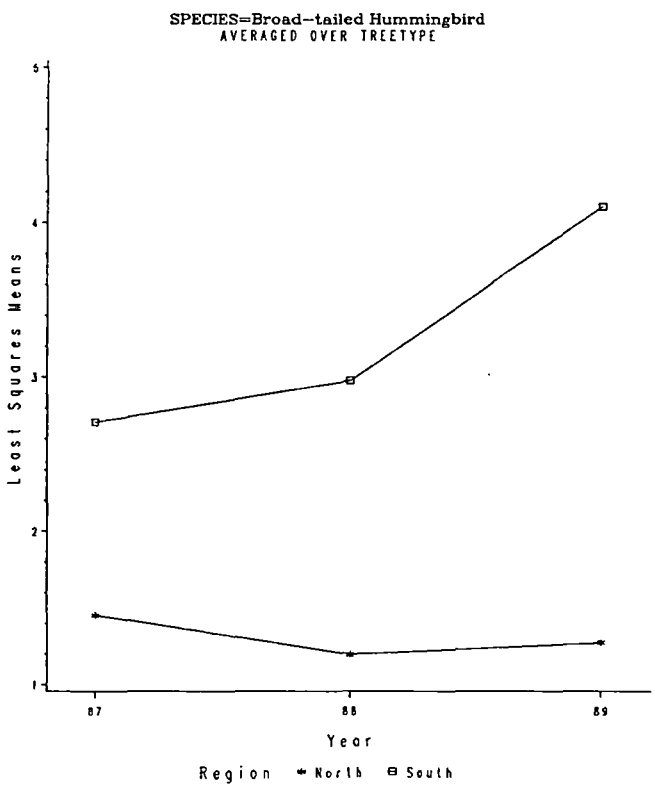

SPECIES=Black-headed Grosbeak
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

Fig. 4. Least squares means for Broad-tailed Hummingbird in 6 habitats.







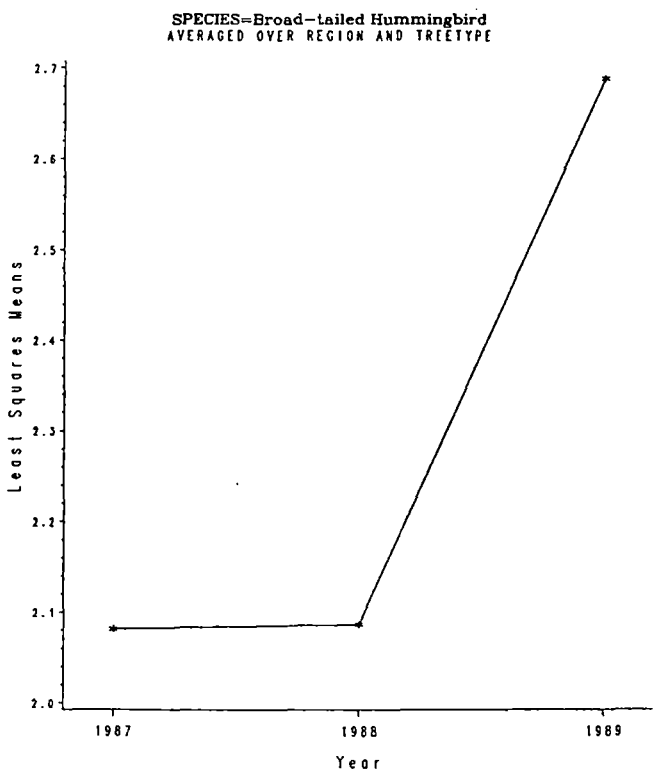
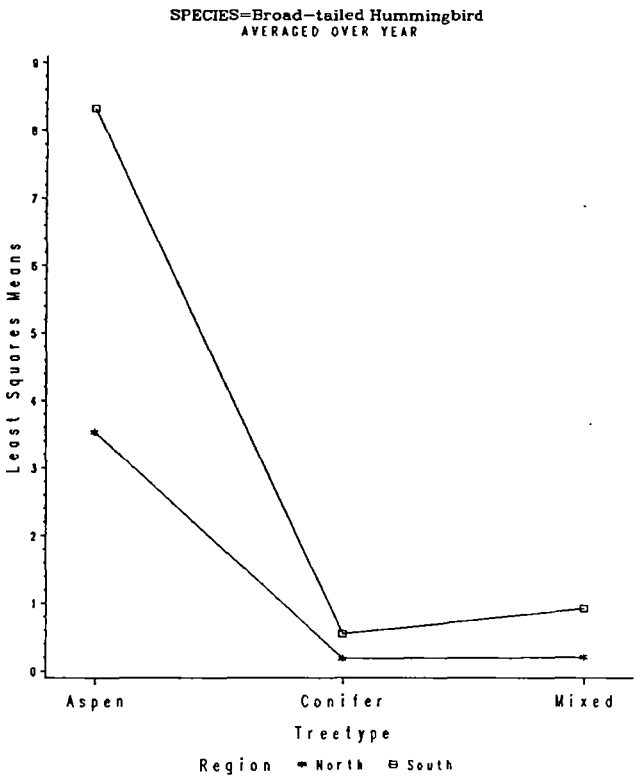
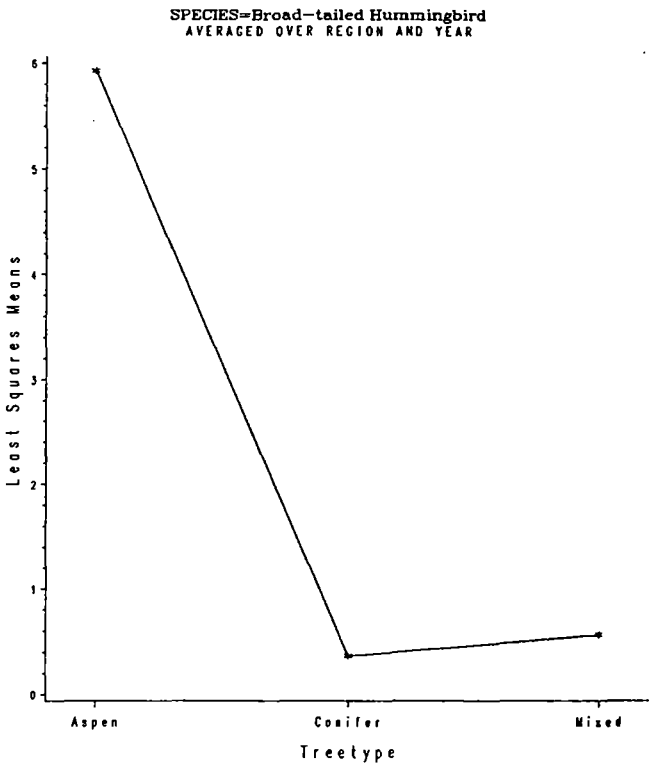


Fig. 4 (cont).


SPECIES=Broad-tailed Hummingbird
AVERAGED OVER YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Broad-tailed Hummingbird
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

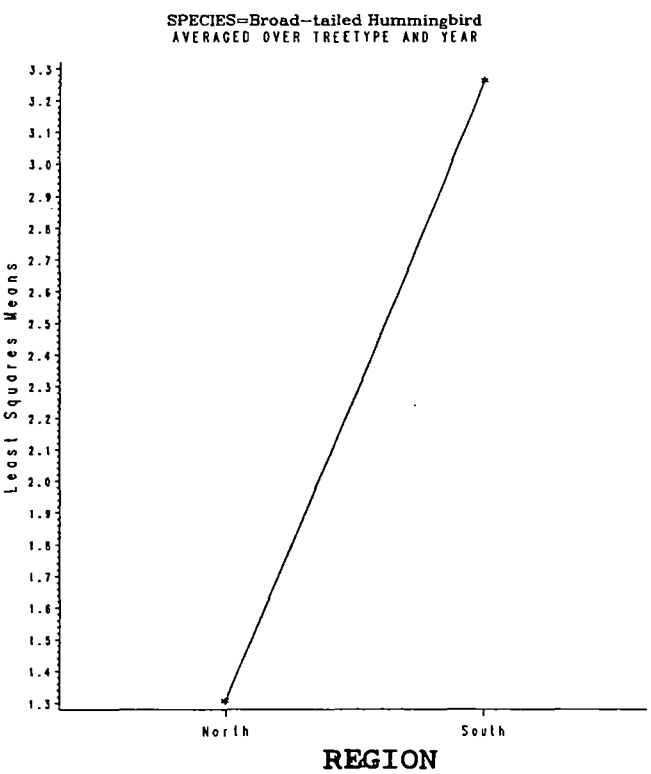
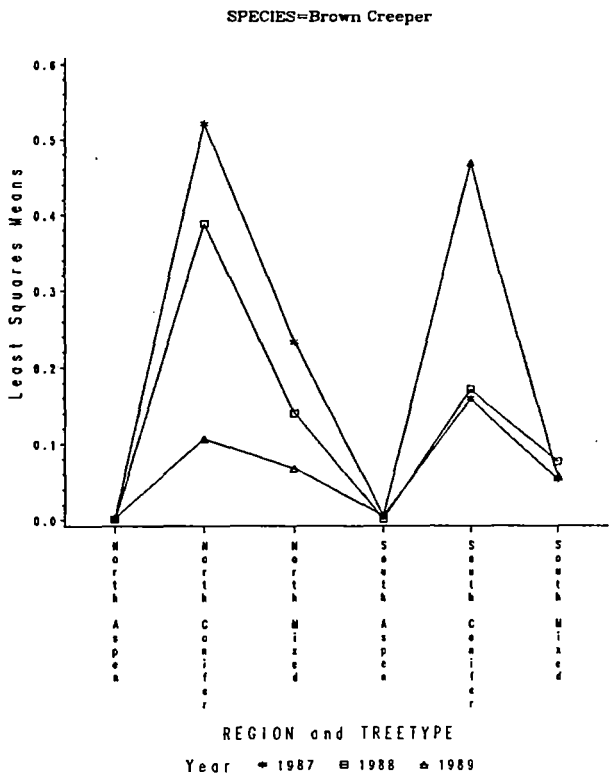
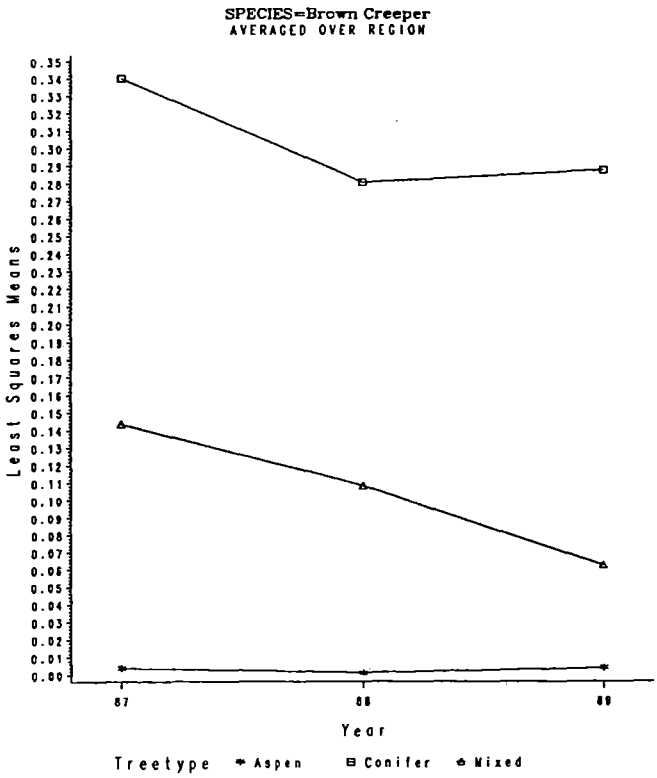
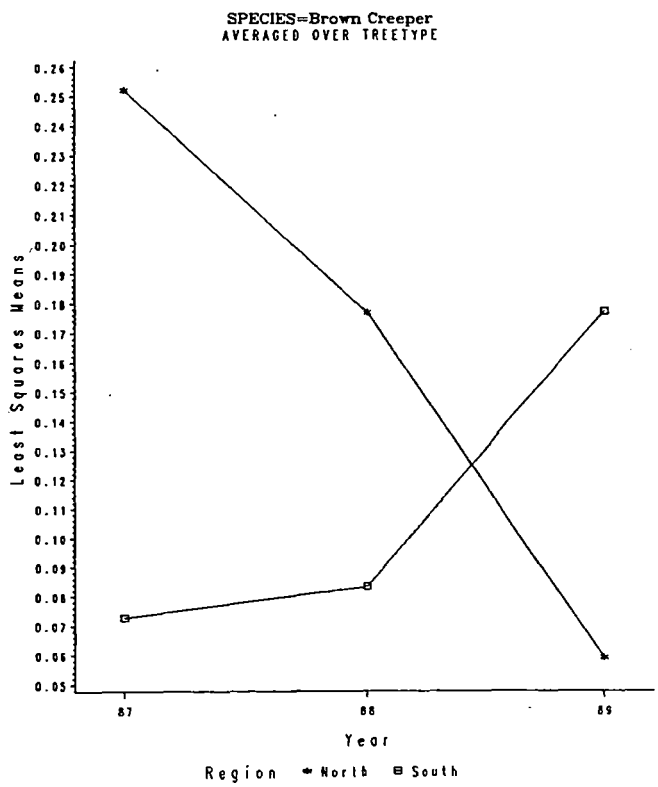
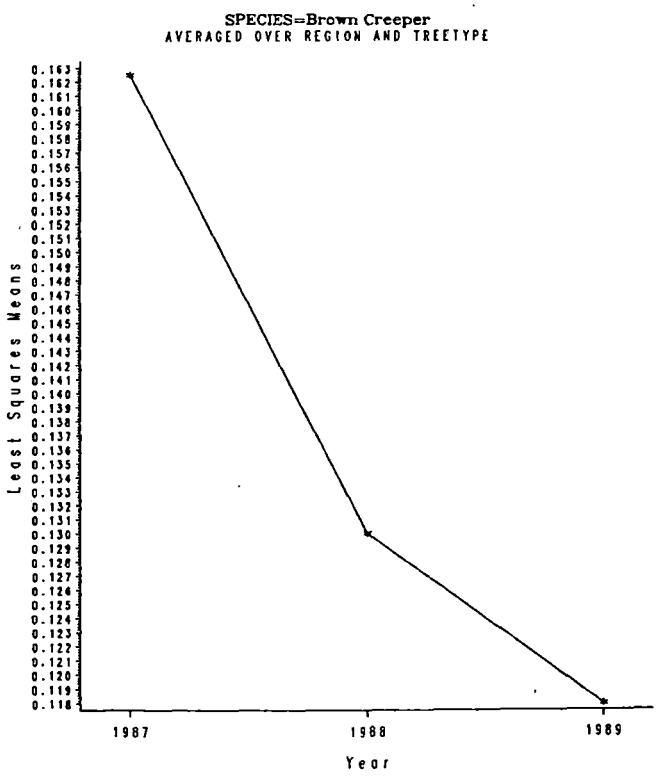

SPECIES=Broad-tailed Hummingbird
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

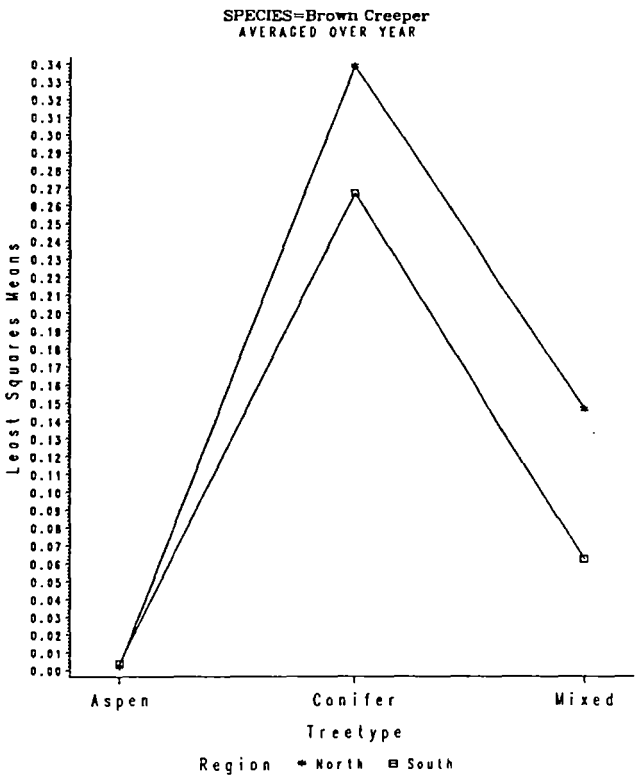
Fig. 5. Least squares means for Brown Creeper in 6 habitats.

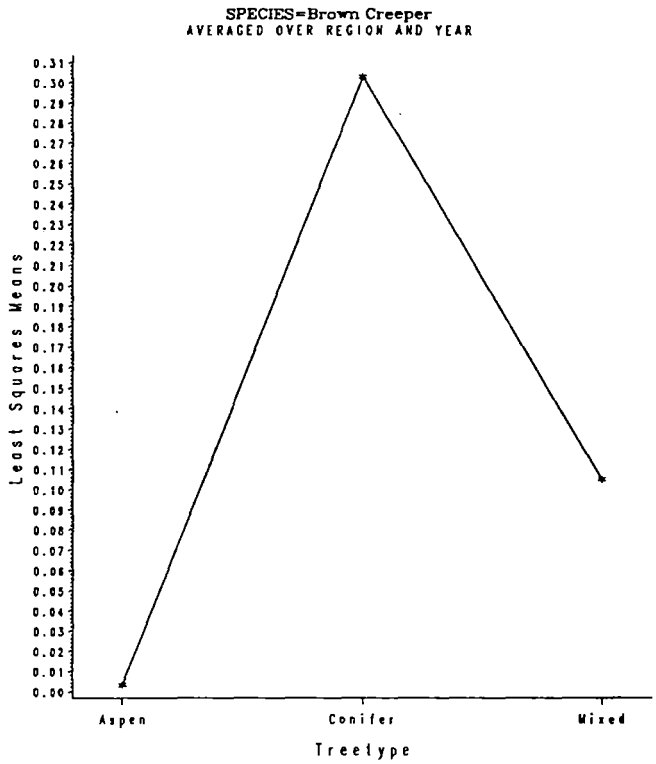









SPECIES=Brown Creeper
AVERAGED OVER YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype
Region
North
South


SPECIES=Brown Creeper
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

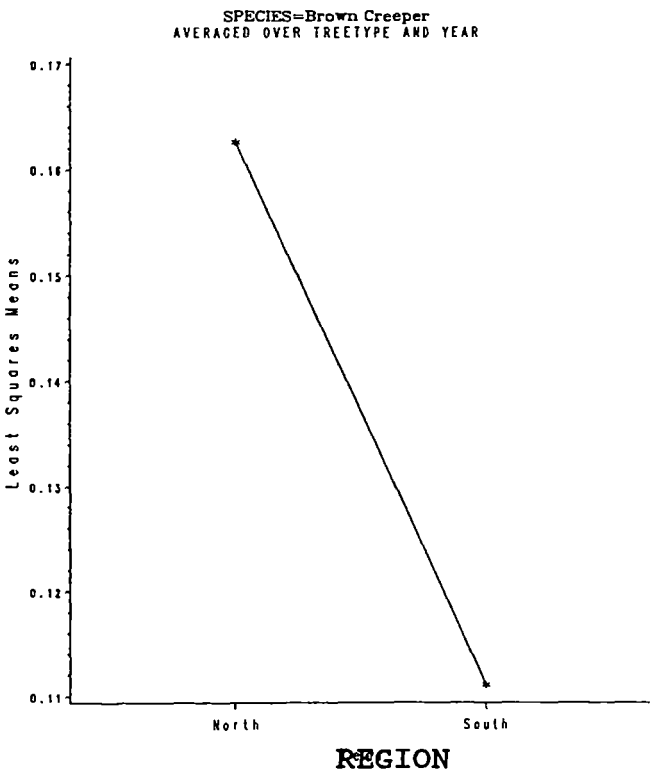
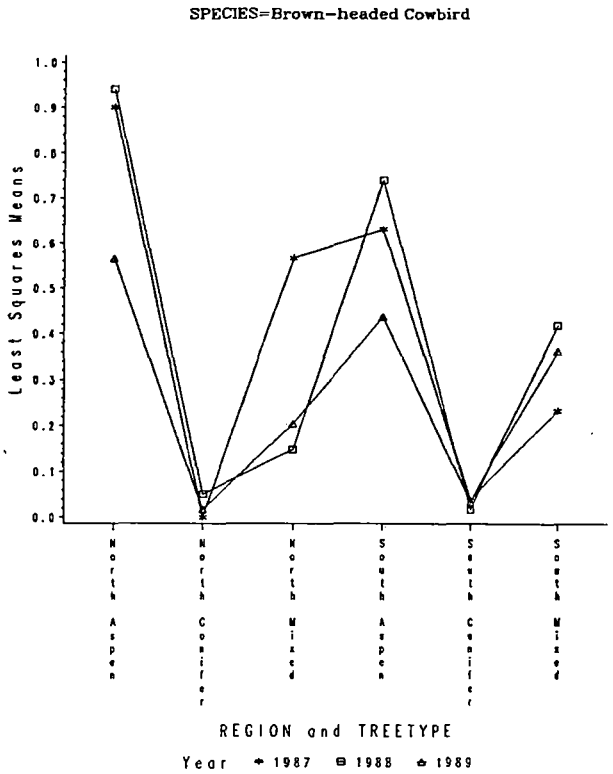
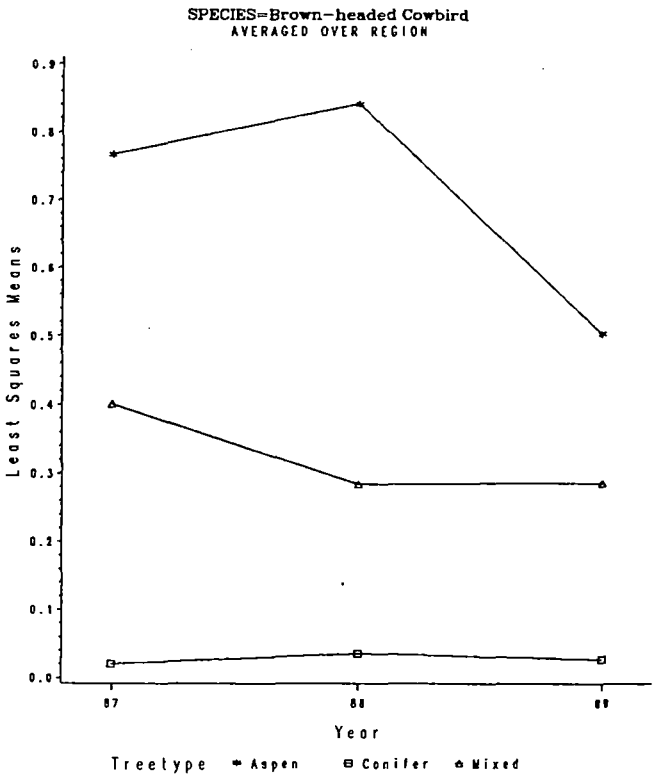

SPECIES=Brown Creeper
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

Fig. 6. Least squares means for Brown-headed Cowbird in 6 habitats.

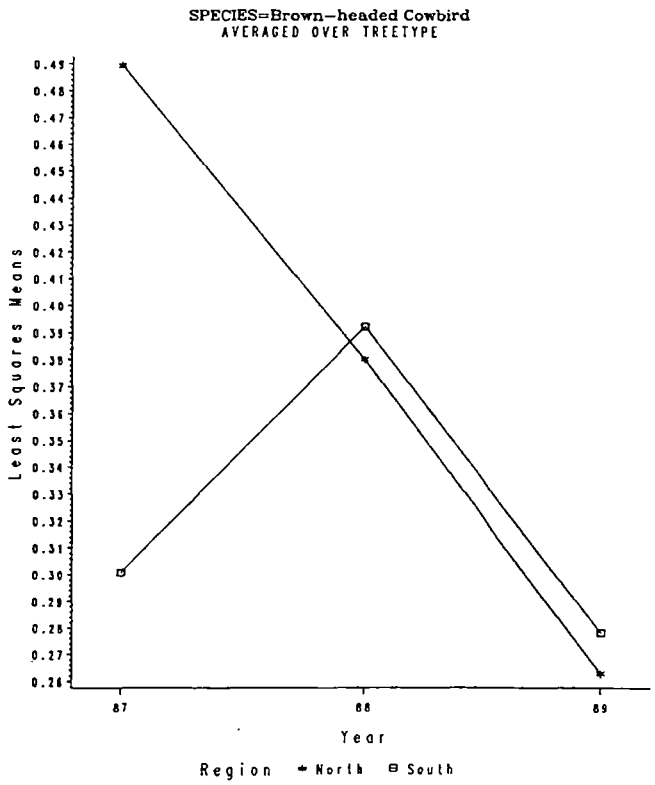
a. Year by region by treetype interaction. (P < 0.43)



b. Year by treetype interaction. (P = 0.11)



c. Year by region interaction. (P < 0.26)



d. Year main effect. (P = 0.15)

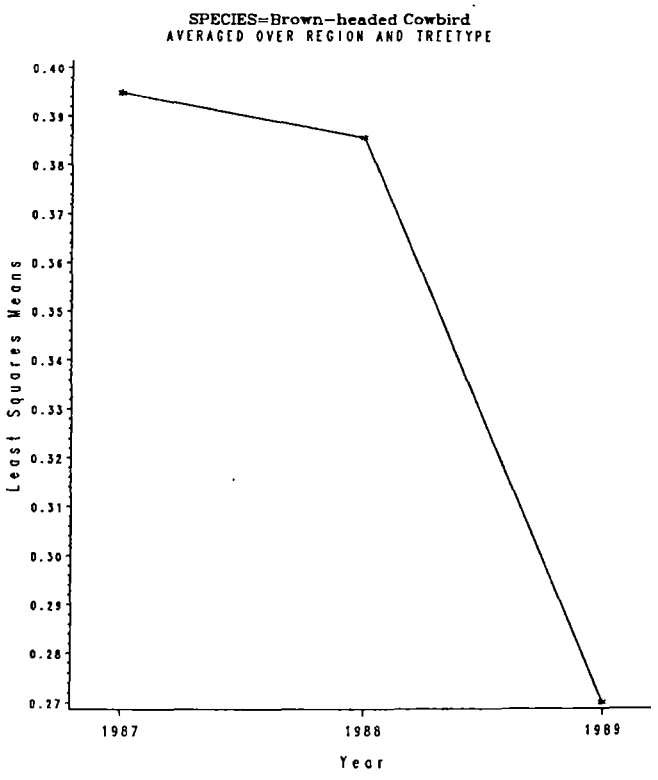
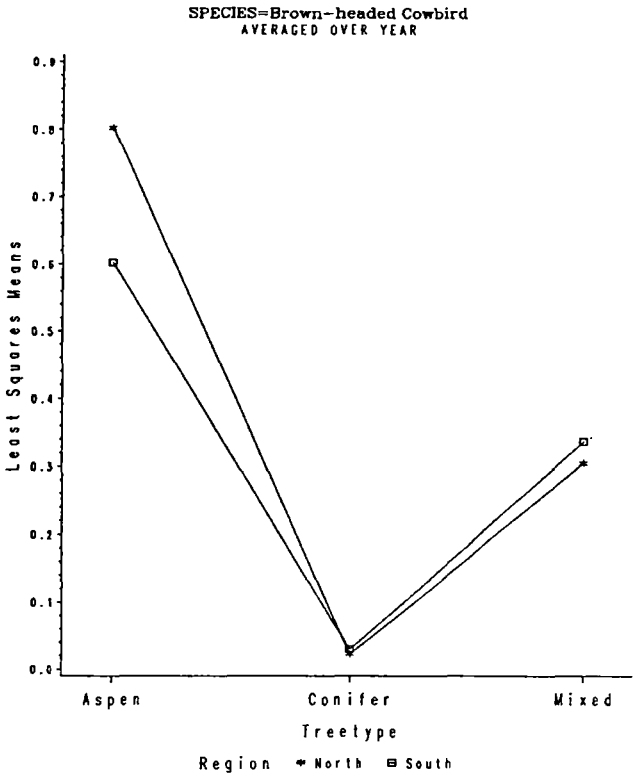
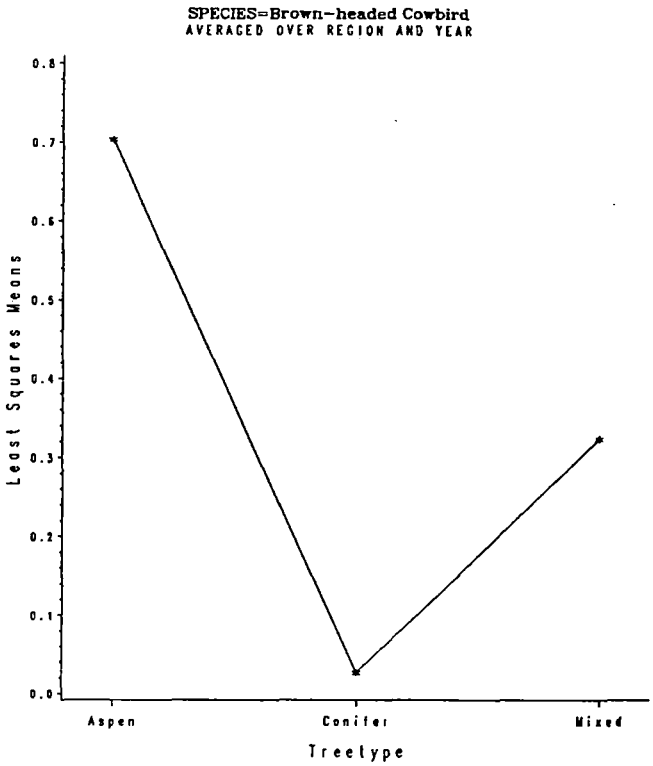


Fig. 6. (cont.).

e. Region by treetype interaction. (P = 0.73)



f. Treetype main effect. (P < 0.00)



g. Region main effect. (P = 0.73)

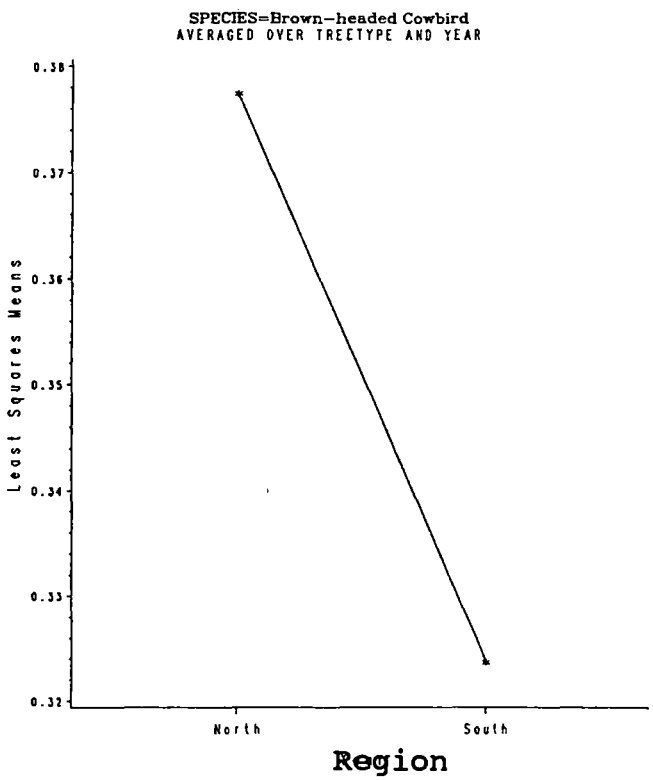


Fig. 7. Least squares means for Cassin's Finch in 6 habitats.

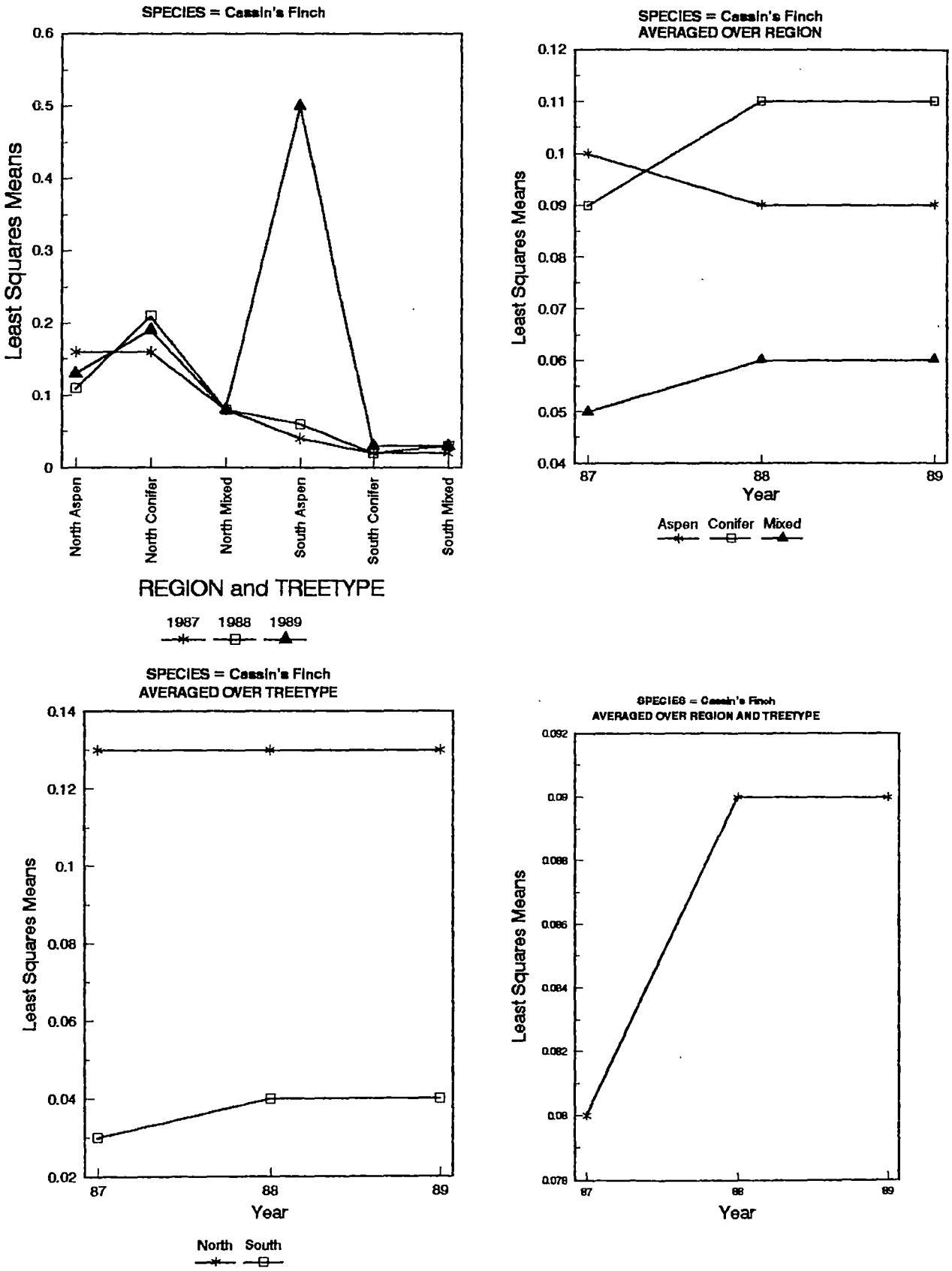
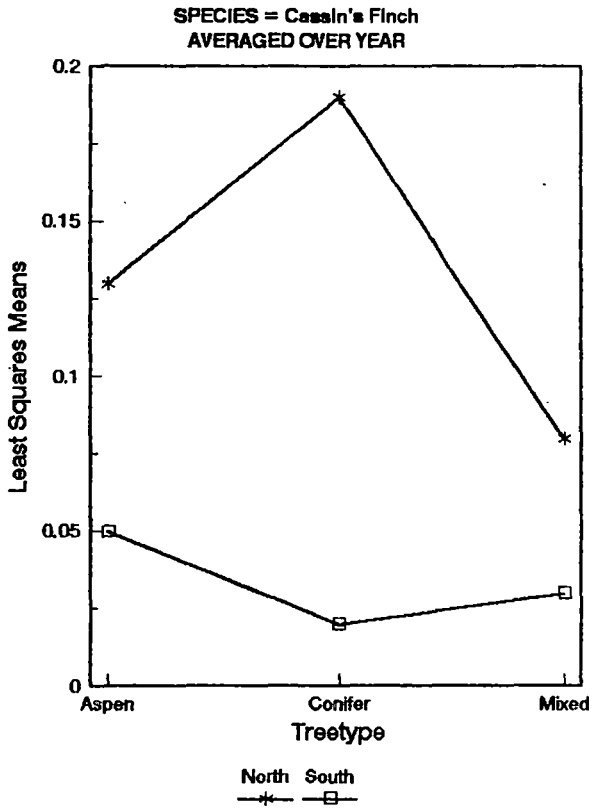
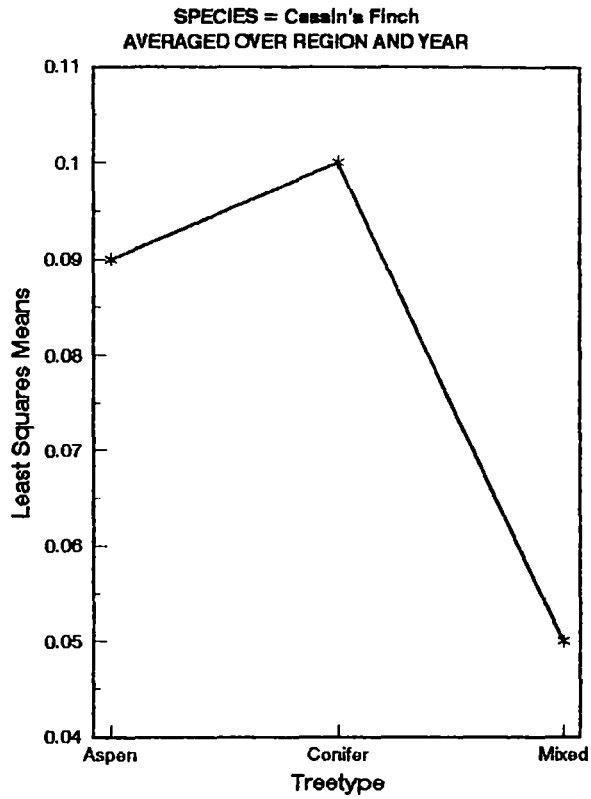


Fig. 7 (cont).


SPECIES = Cassin's Finch
AVERAGED OVER YEAR
Least Squares Means
0.2
0.15
0.1
0.05
0
Aspen
Conifer
Mixed
Treetype
North
South


SPECIES = Cassin's Finch
AVERAGED OVER REGION AND YEAR
Least Squares Means
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
Aspen
Conifer
Mixed
Treetype

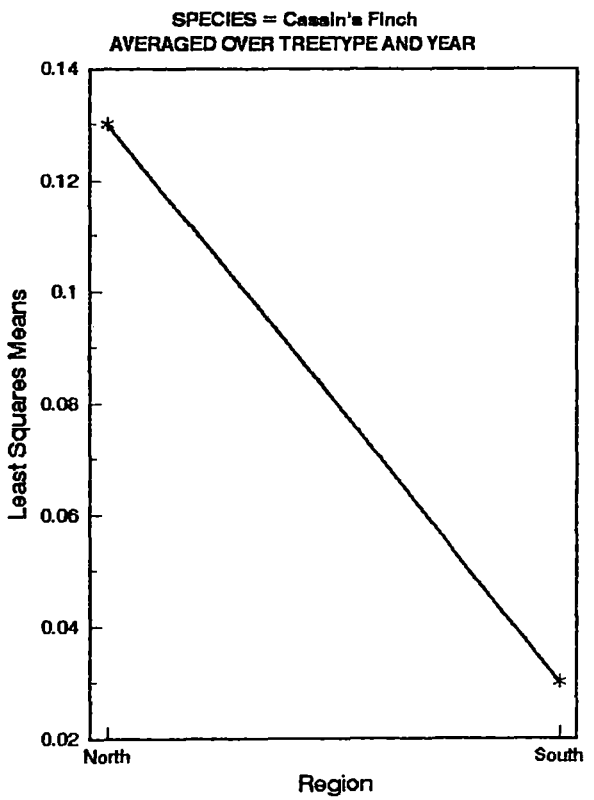
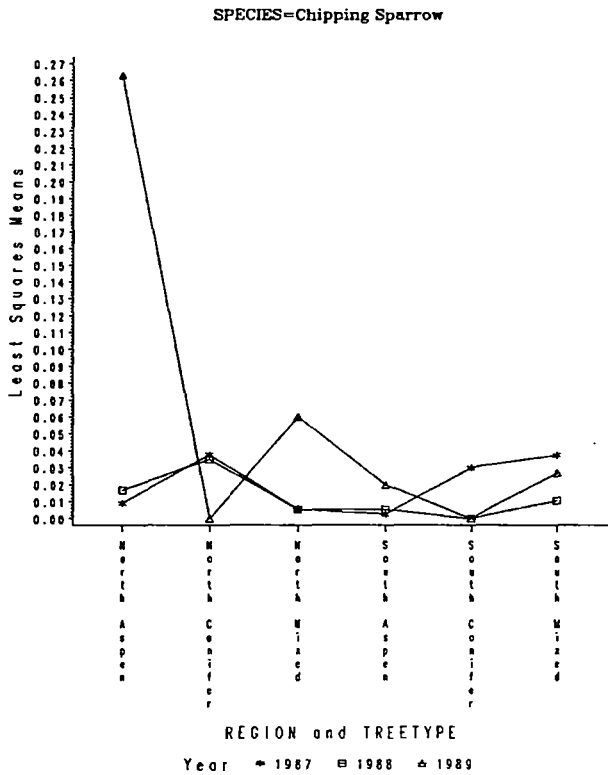
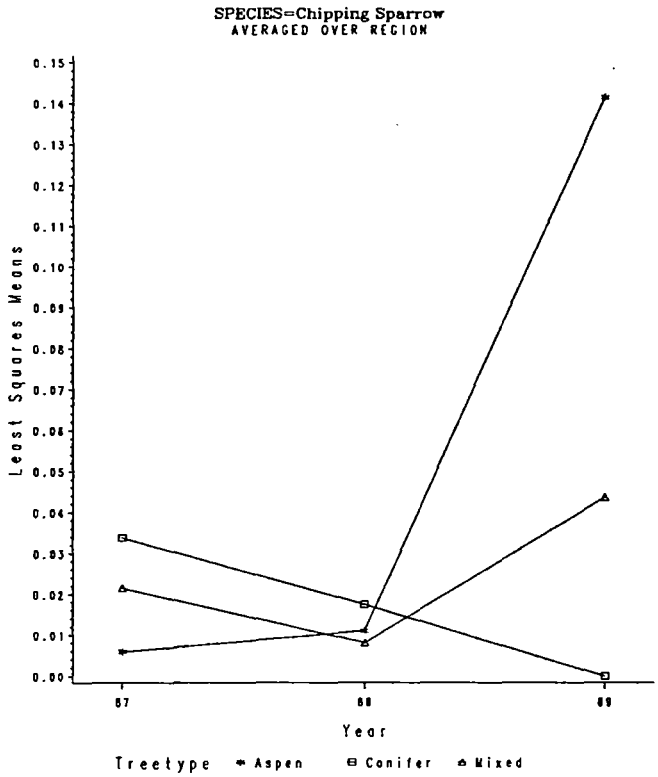
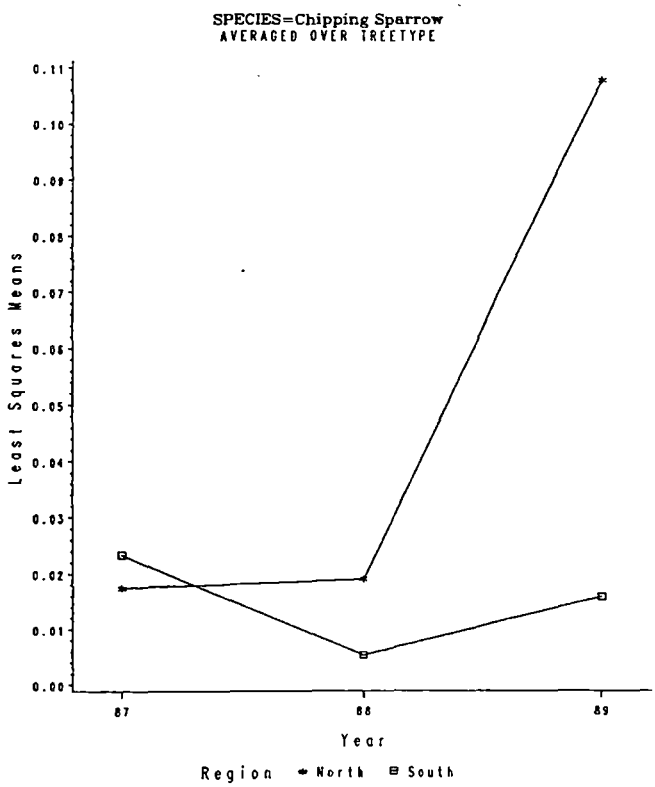

SPECIES = Cassin's Finch
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
0.14
0.12
0.1
0.08
0.06
0.04
0.02
North
South
Region

Fig. 8. Least squares means for Chipping Sparrow in 6 habitats.







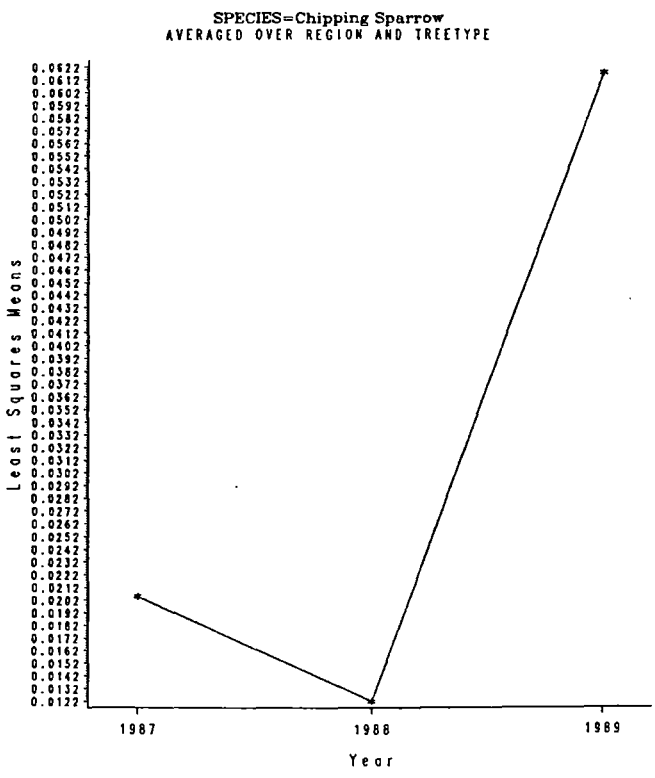
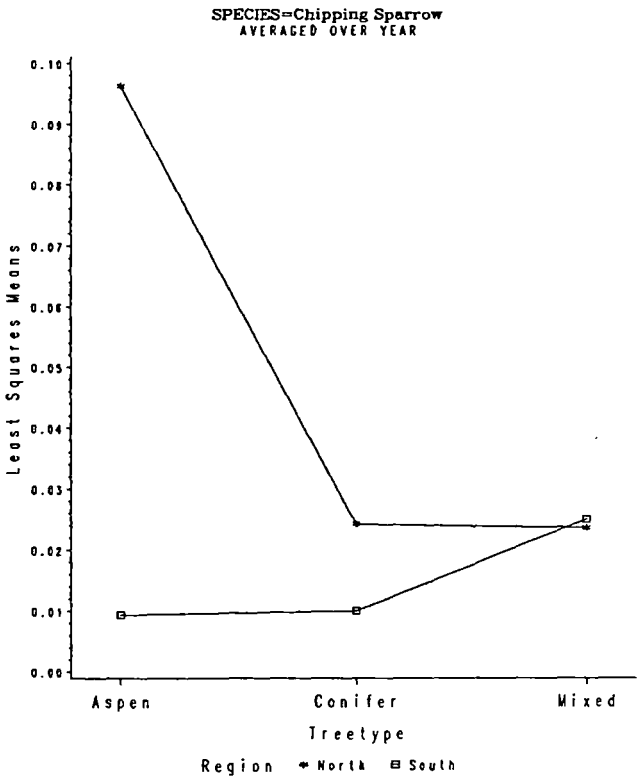
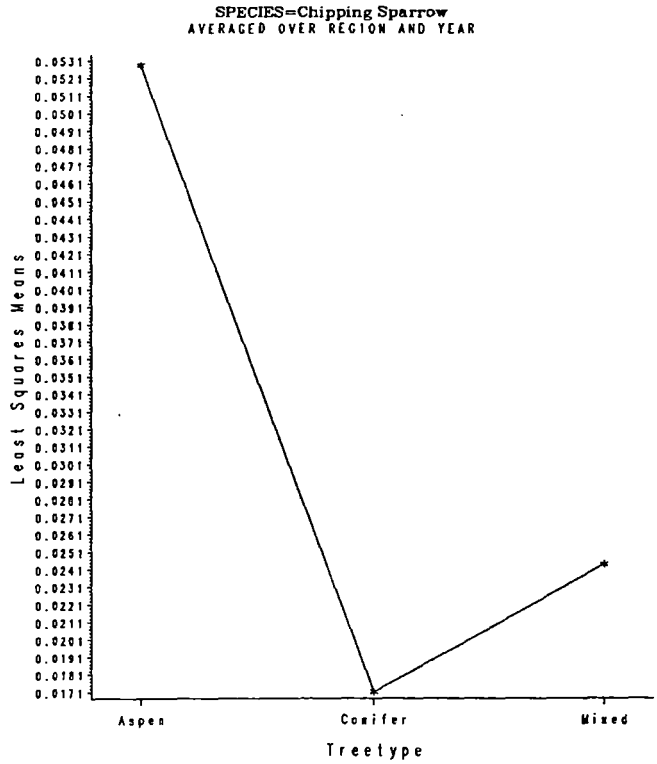


Fig. 8 (cont).


SPECIES=Chipping Sparrow
AVERAGED OVER YEAR
Least Squares Means
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Chipping Sparrow
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

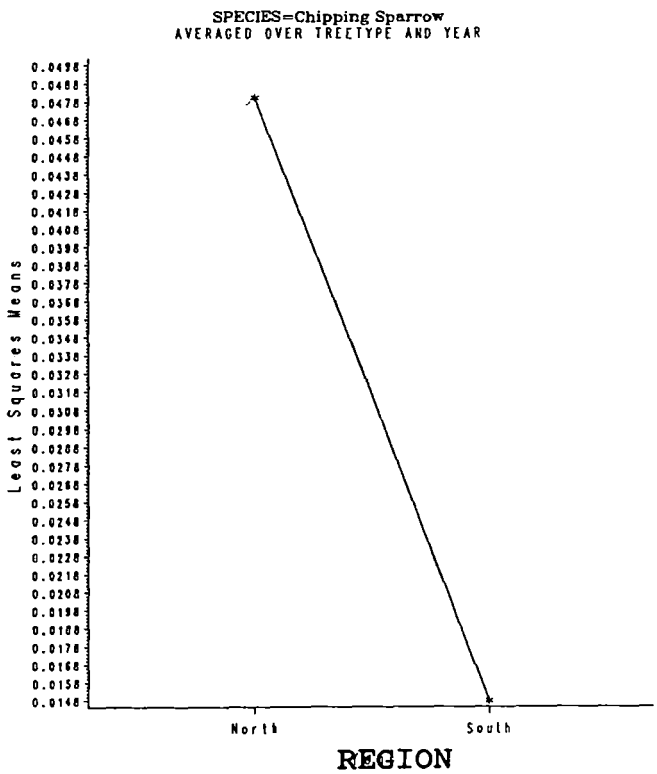
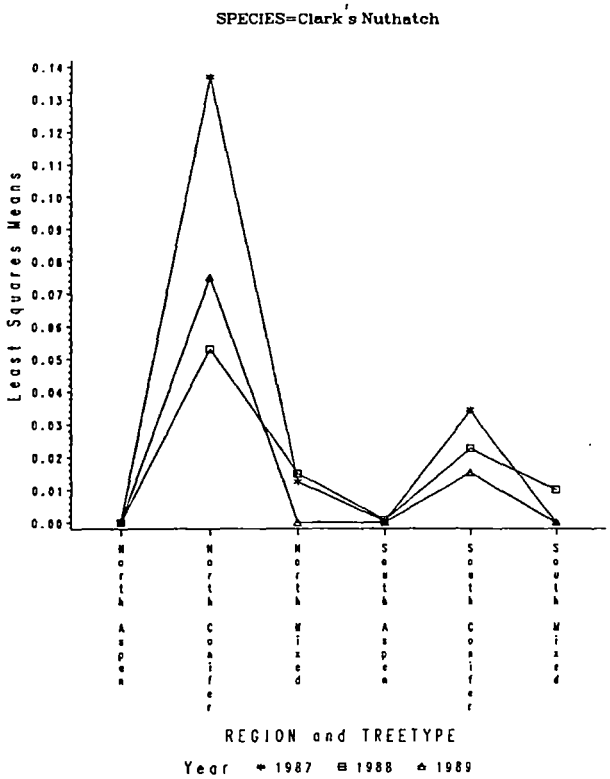
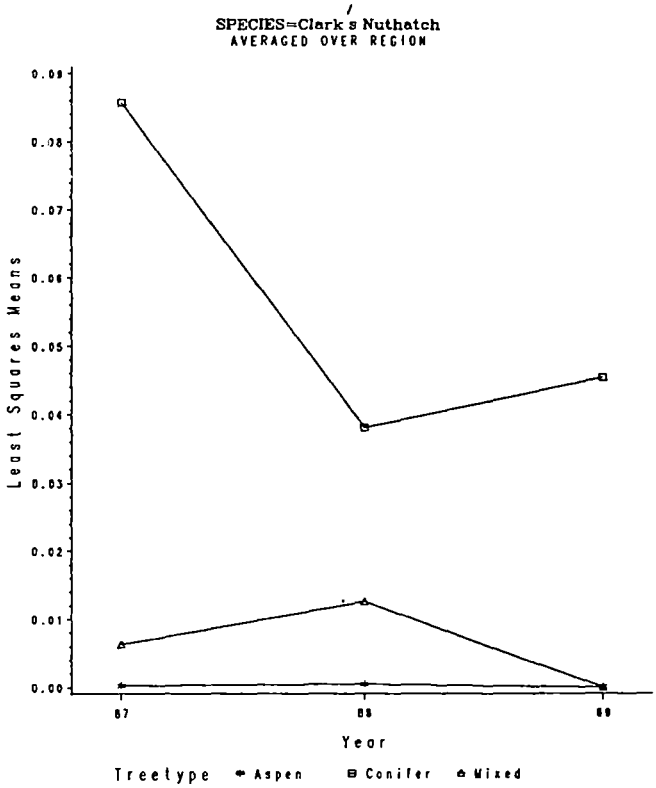
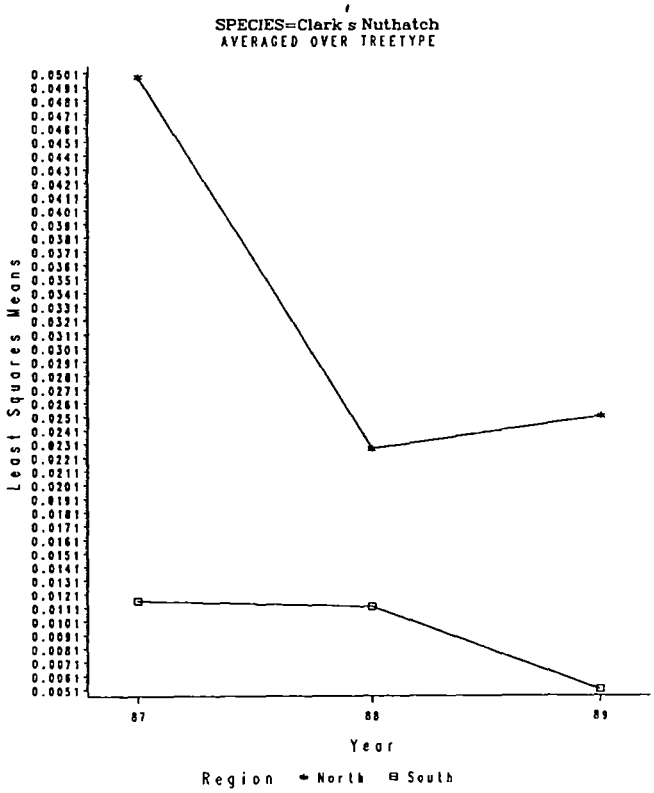

SPECIES=Chipping Sparrow
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

Fig. 9. Least squares means for Clark's Nuthatch in 6 habitats.







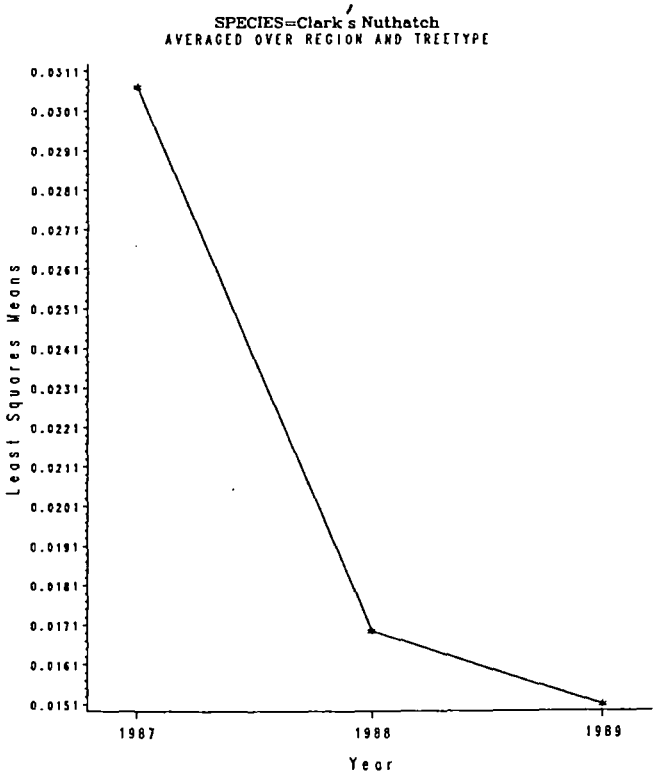
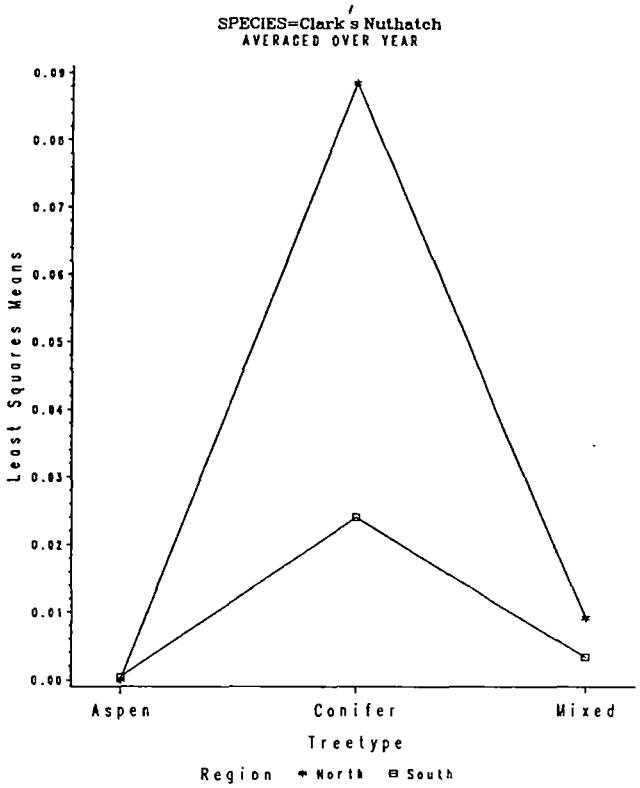
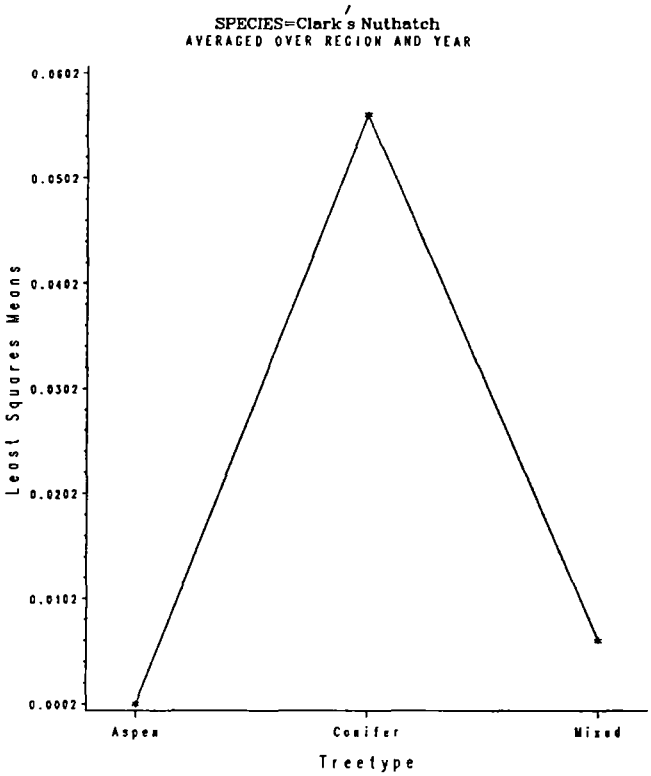


Fig. 9 (cont).


SPECIES=Clark's Nuthatch
AVERAGED OVER YEAR
Least Squares Means
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Clark's Nuthatch
AVERAGED OVER REGION AND YEAR
Least Squares Means
0.0602
0.0502
0.0402
0.0302
0.0202
0.0102
0.0002
Aspen
Conifer
Mixed
Treetype

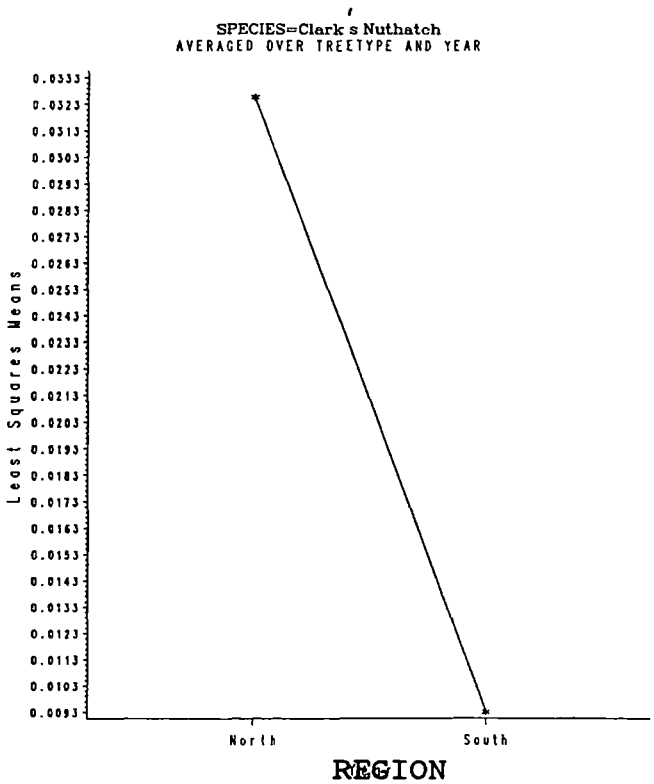
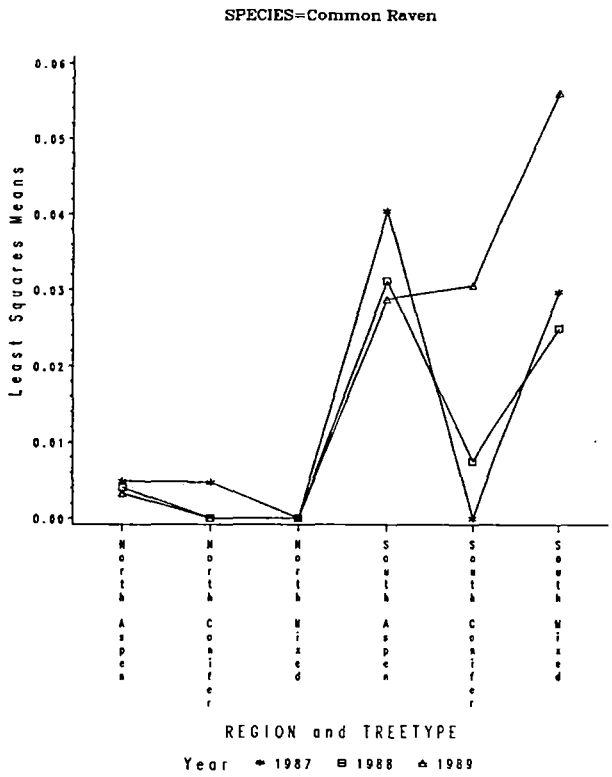
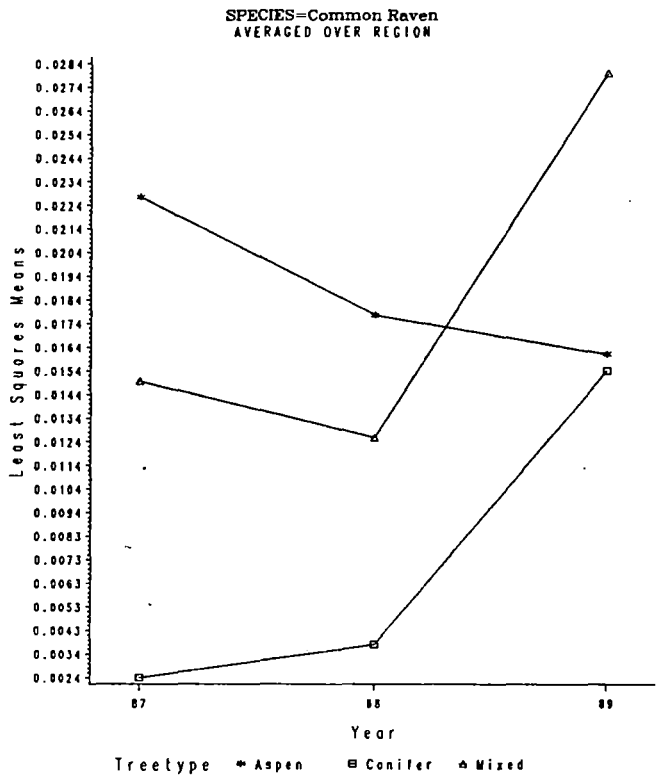
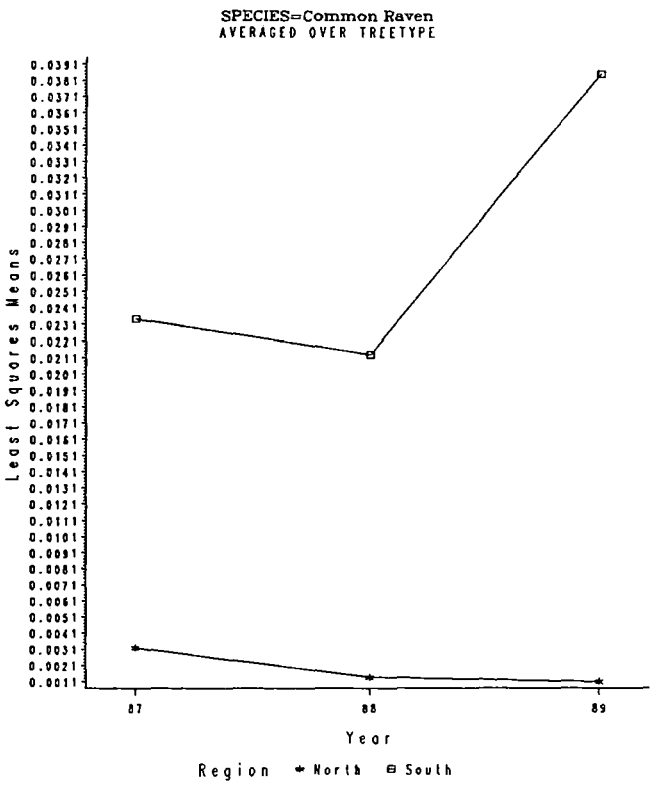

SPECIES=Clark's Nuthatch
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
0.0333
0.0323
0.0313
0.0303
0.0293
0.0283
0.0273
0.0263
0.0253
0.0243
0.0233
0.0223
0.0213
0.0203
0.0193
0.0183
0.0173
0.0163
0.0153
0.0143
0.0133
0.0123
0.0113
0.0103
0.0093
North
South
REGION

Fig. 10. Least squares means for Common Raven in 6 habitats.







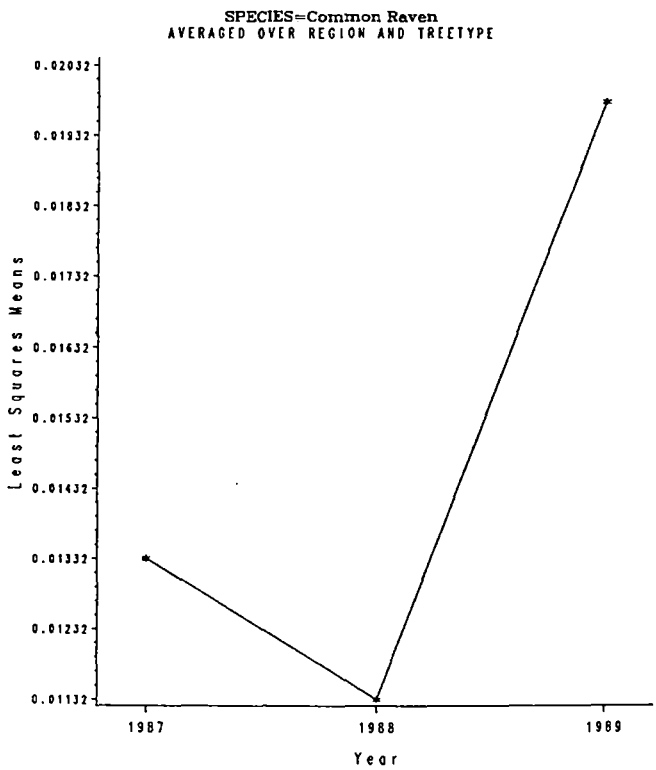
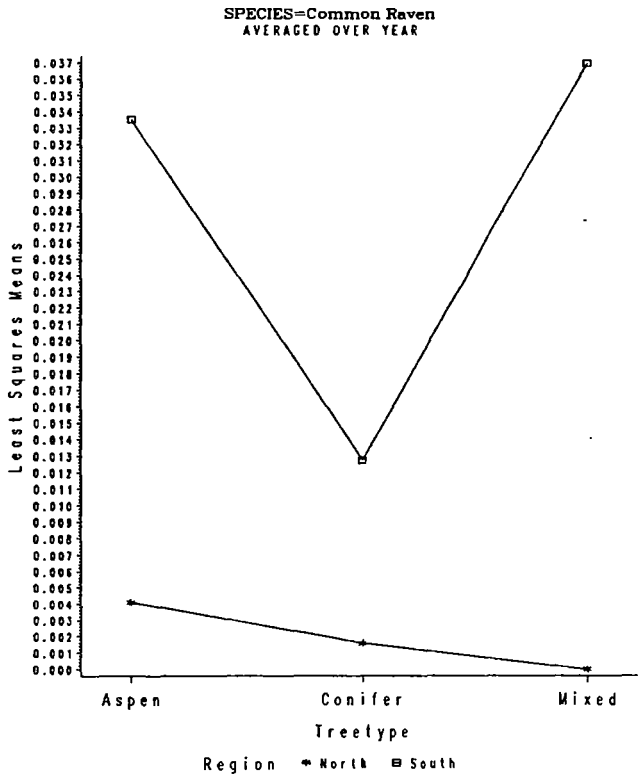
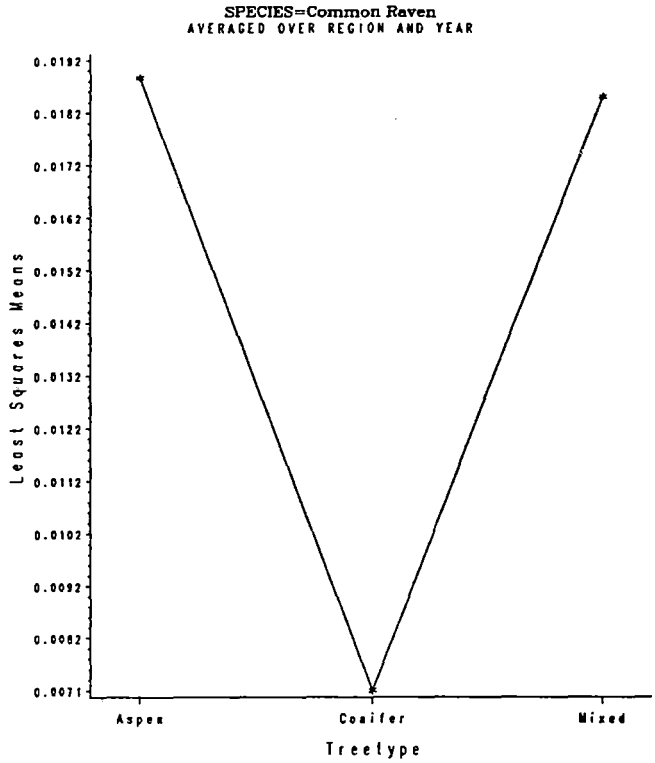


Fig. 10 (cont).


SPECIES=Common Raven
AVERAGED OVER YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype
Region
North
South


SPECIES=Common Raven
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

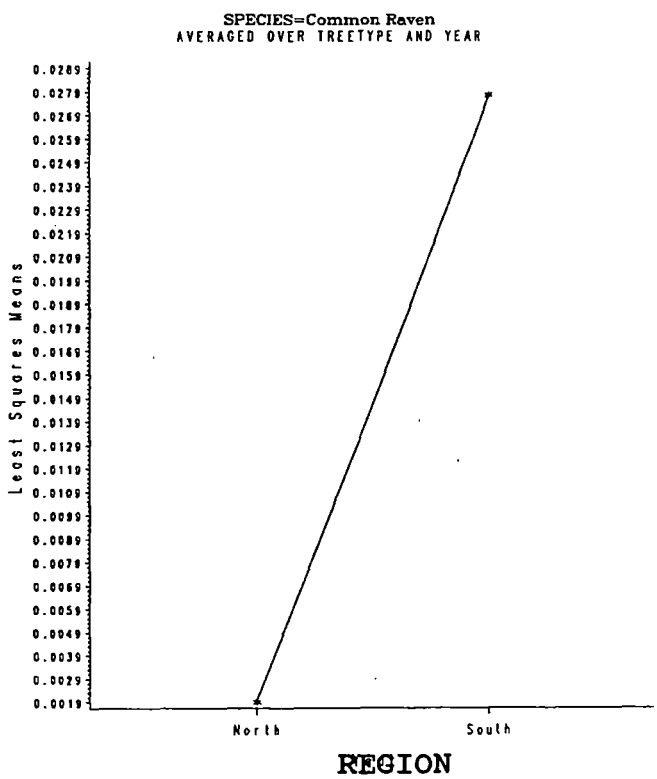
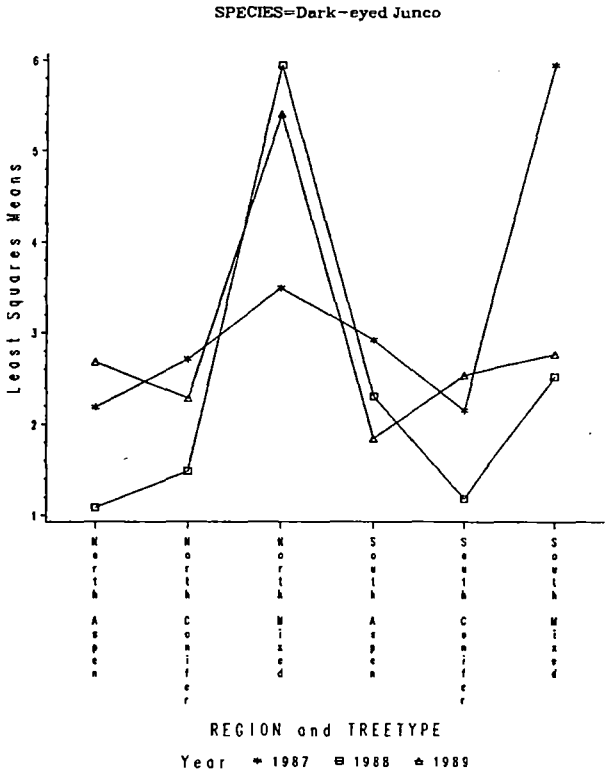
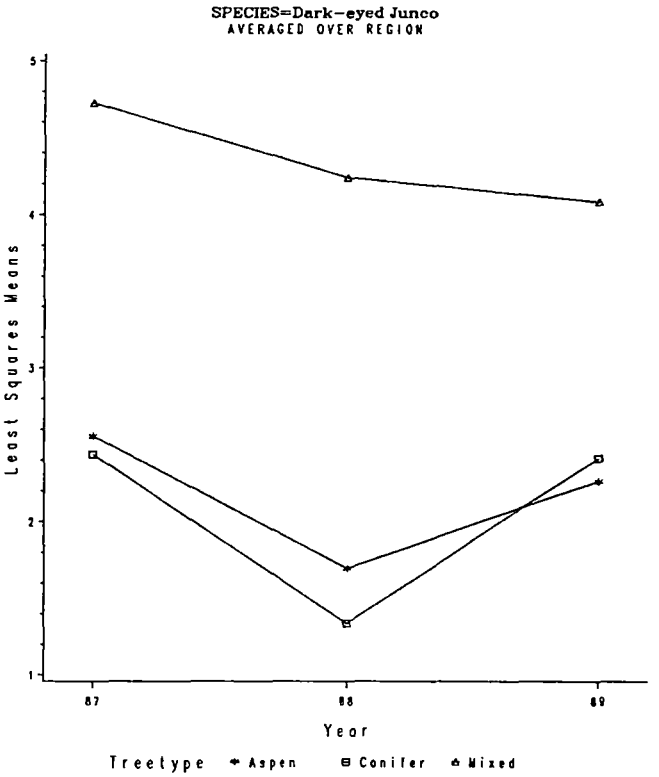
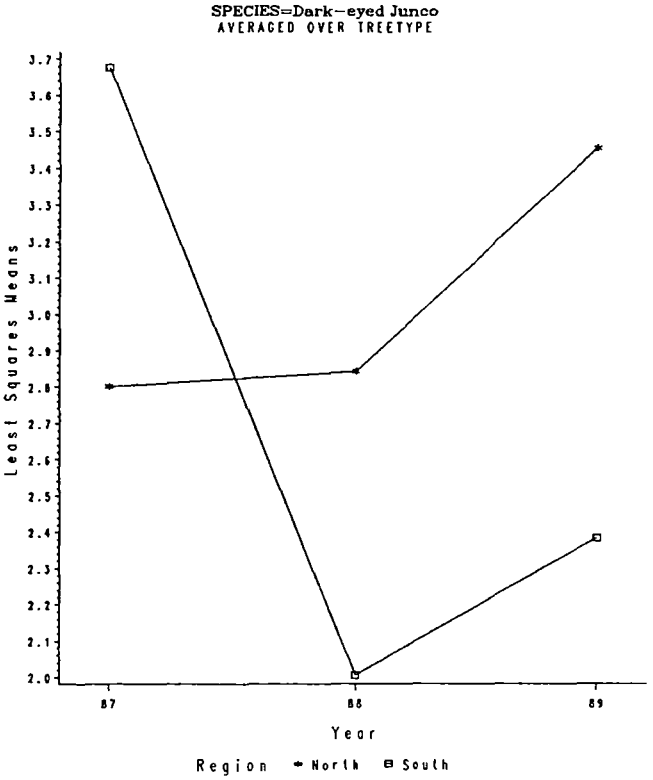
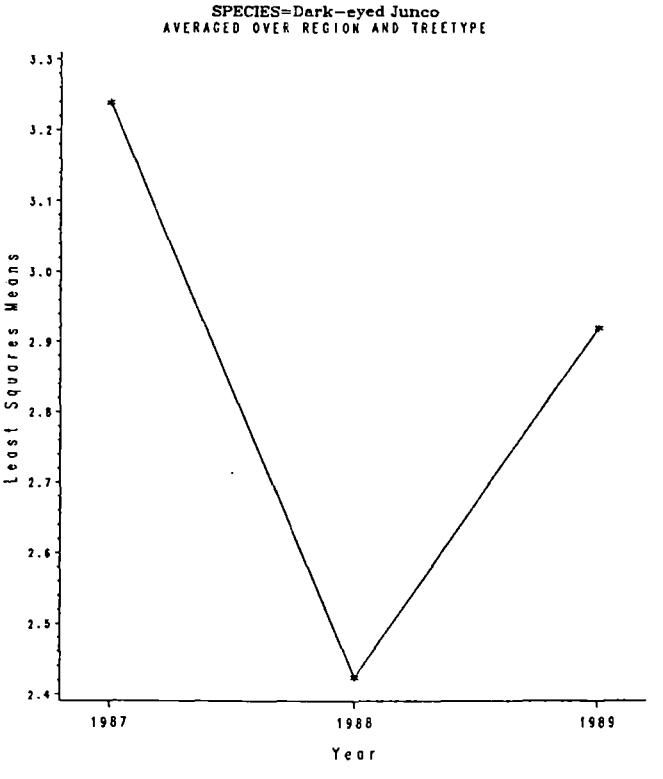

SPECIES=Common Raven
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

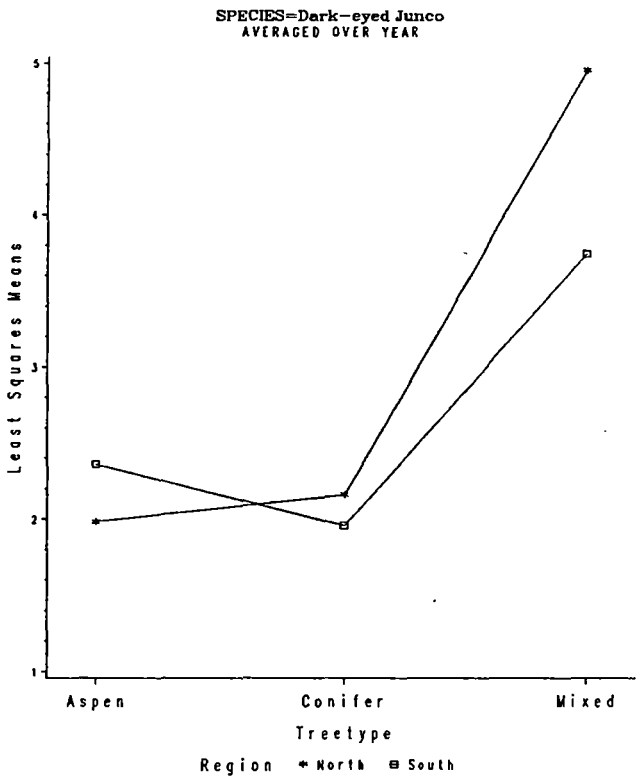
Fig. 11. Least squares means for Dark-eyed Junco in 6 habitats.

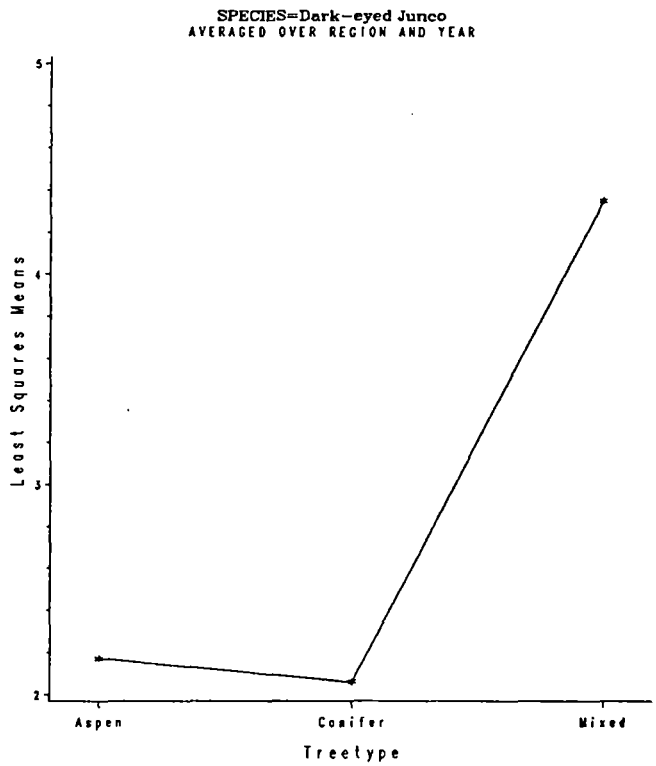









SPECIES=Dark-eyed Junco
AVERAGED OVER YEAR
Least Squares Means
5
4
3
2
1
Aspen
Conifer
Mixed
Treetype
Region
North
South


SPECIES=Dark-eyed Junco
AVERAGED OVER REGION AND YEAR
Least Squares Means
5
4
3
2
Aspen
Conifer
Mixed
Treetype

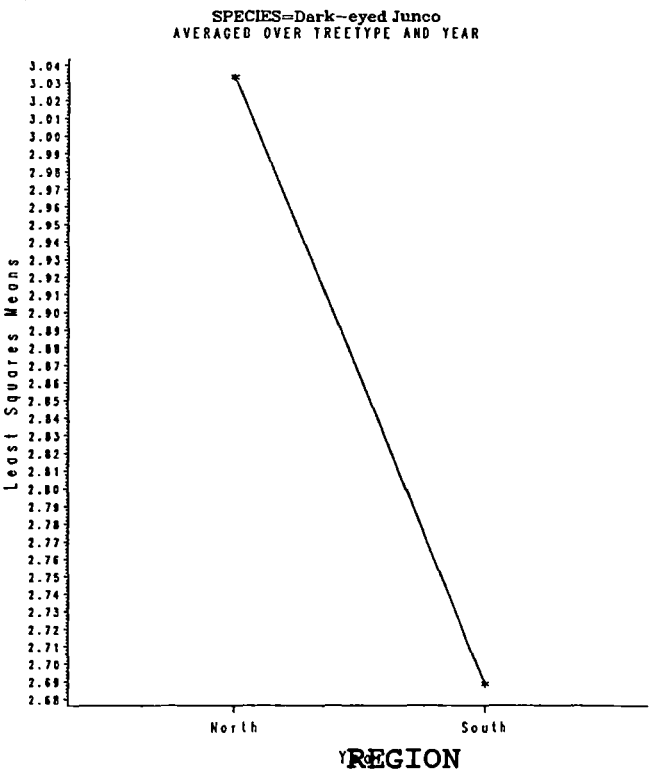
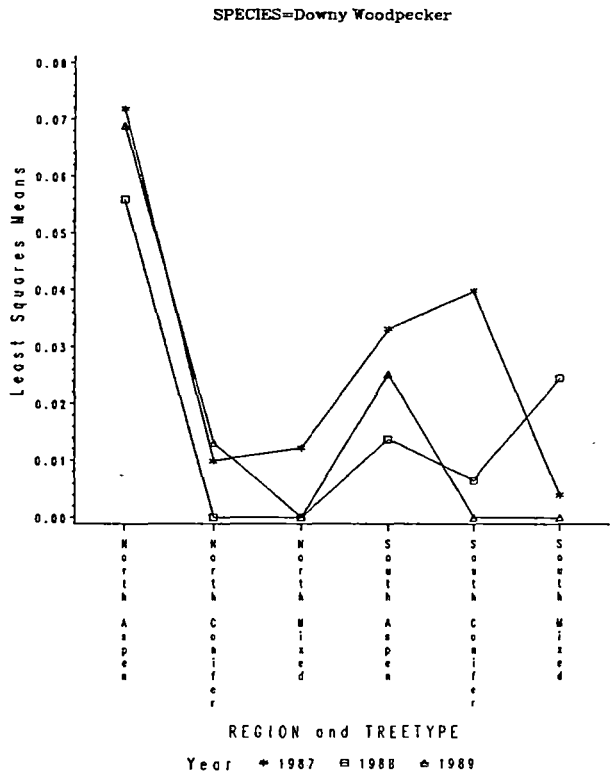
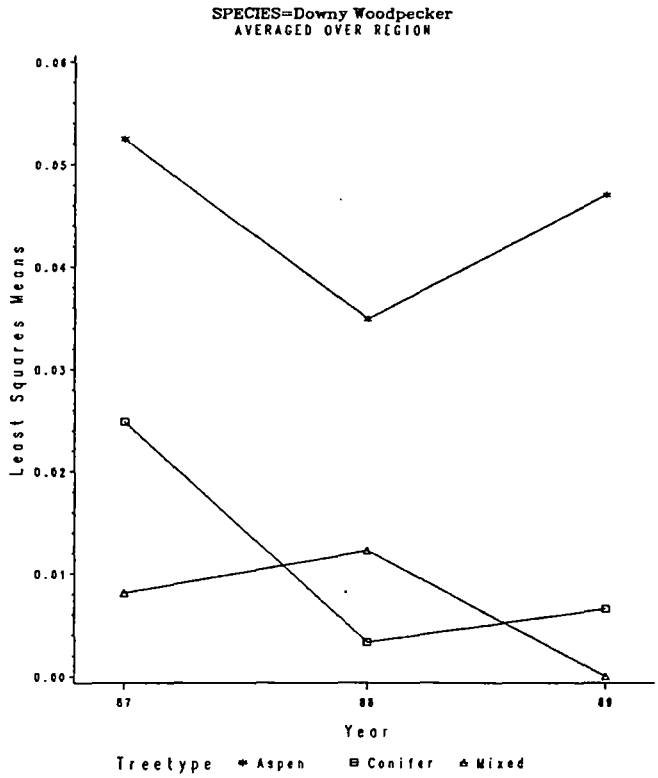
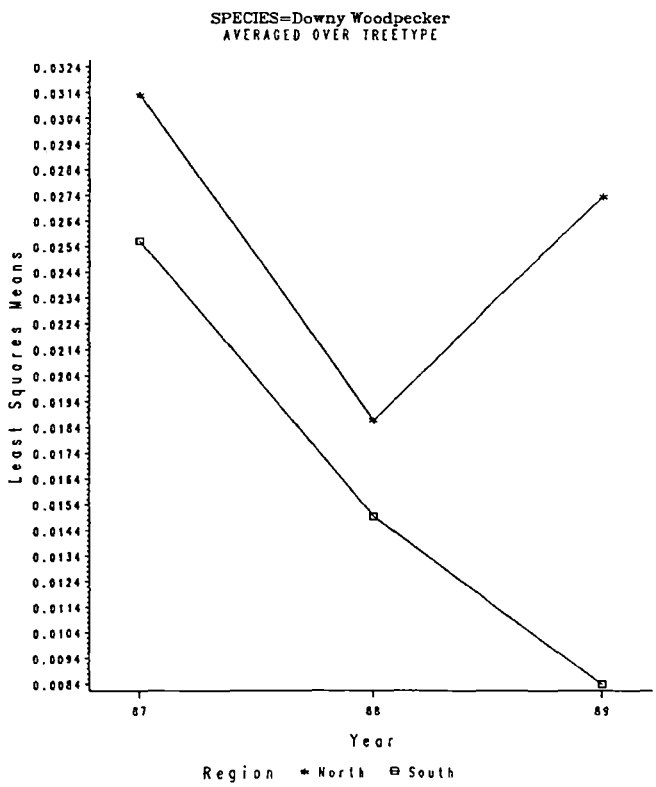
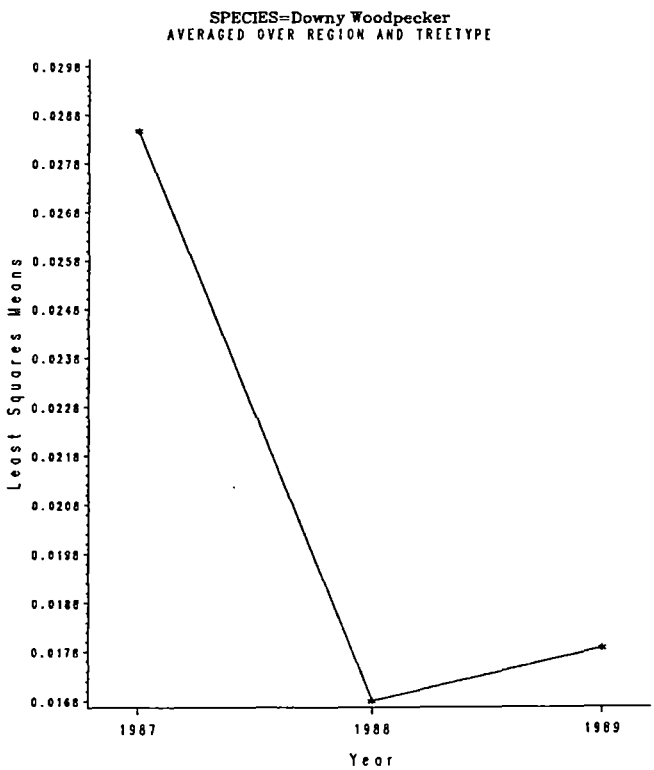

SPECIES=Dark-eyed Junco
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

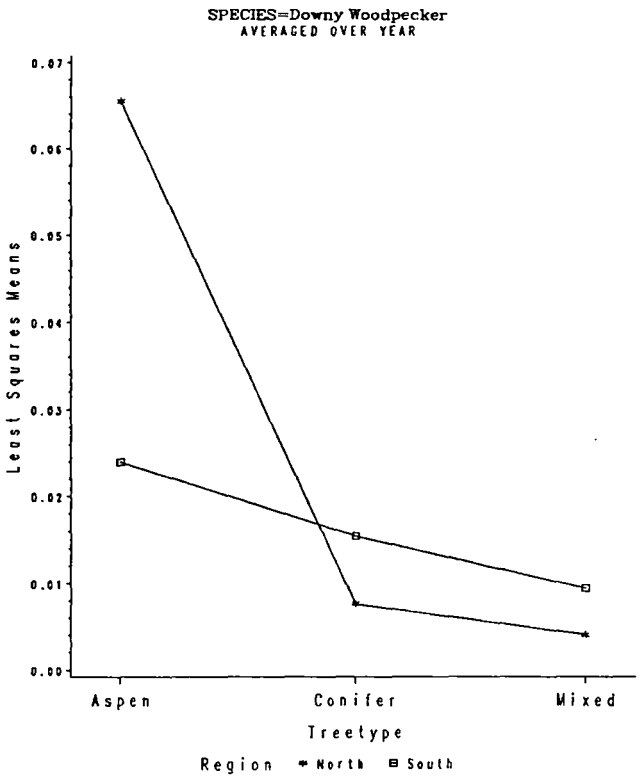
Fig. 12. Least squares means for Downy Woodpecker in 6 habitats.

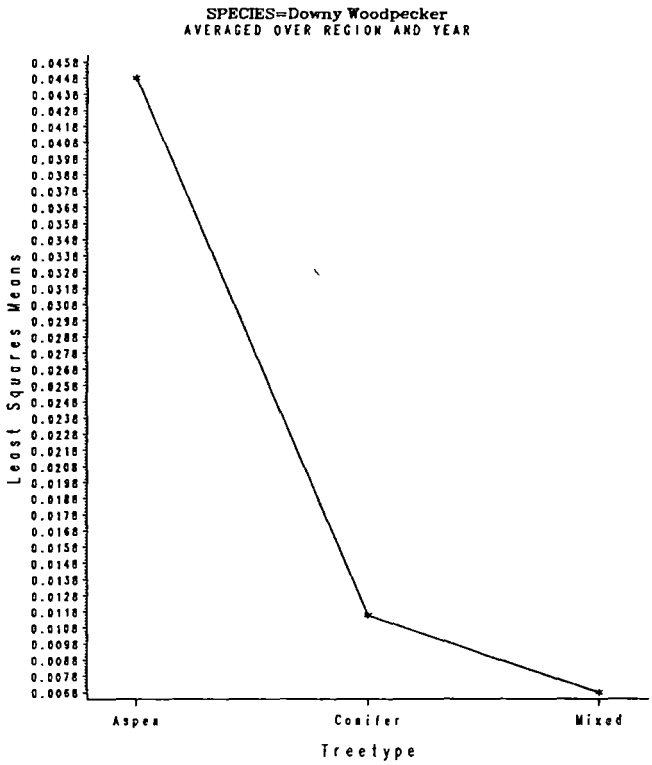









SPECIES=Downy Woodpecker
AVERAGED OVER YEAR
Least Squares Means
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Aspen
Conifer
Mixed
Treetype
Region * North ⊟ South


SPECIES=Downy Woodpecker
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

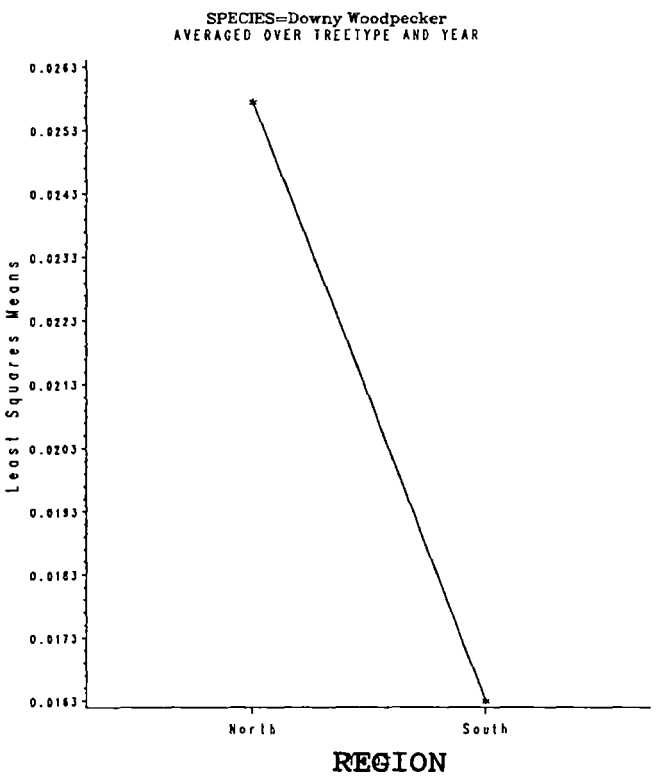
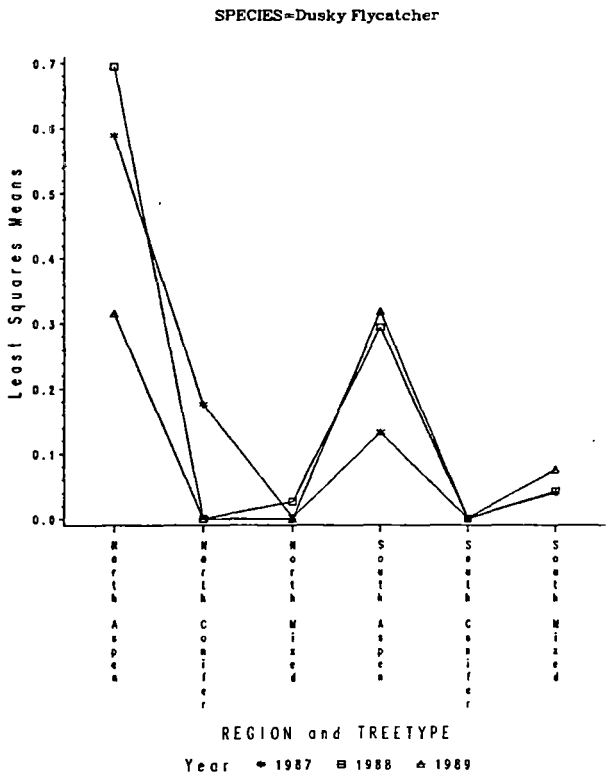
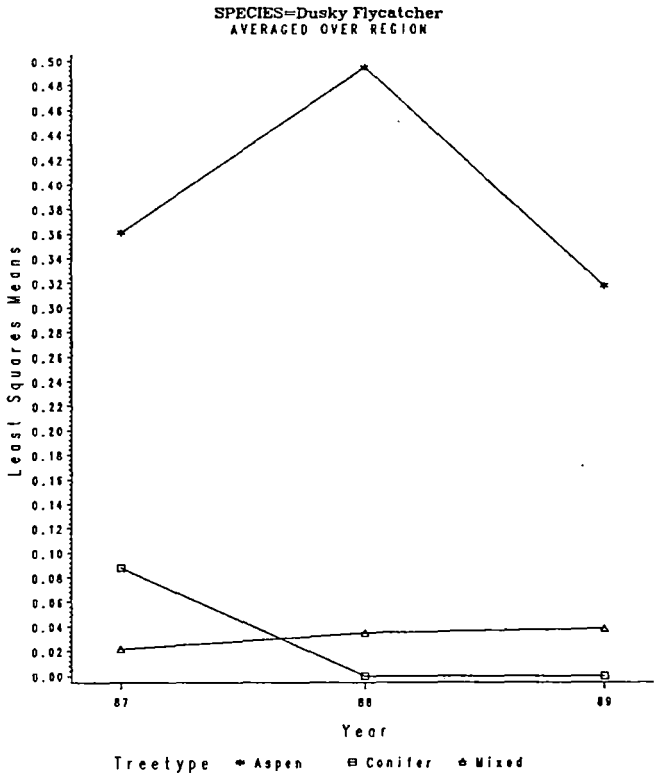
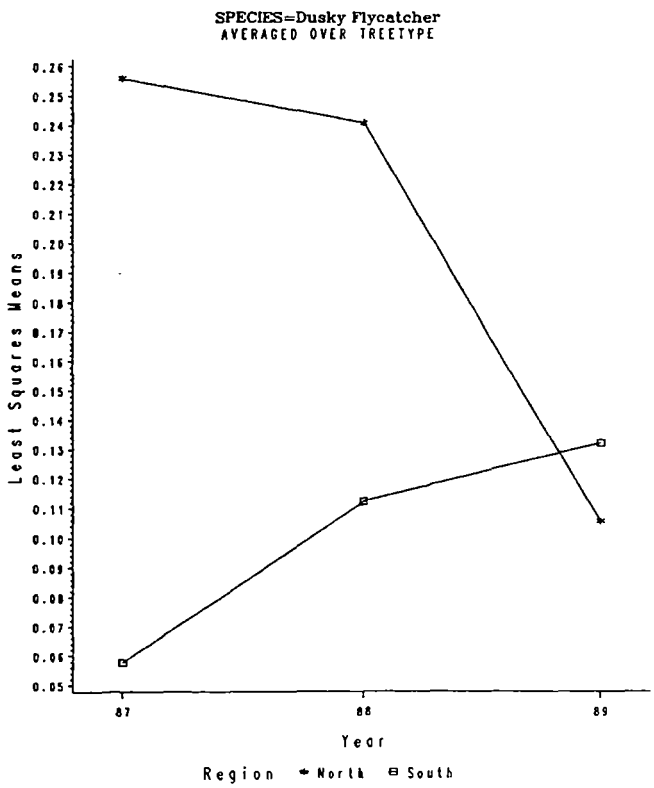
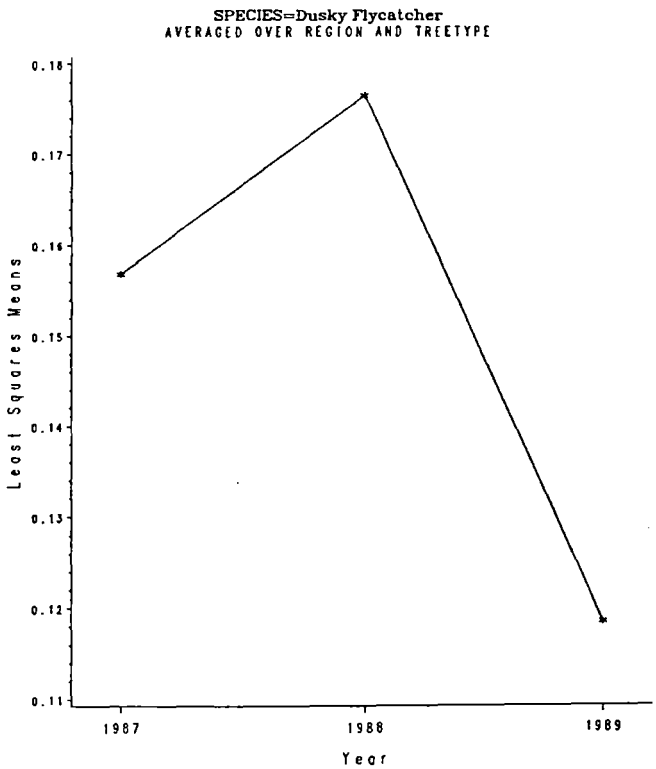

SPECIES=Downy Woodpecker
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
0.0263
0.0253
0.0243
0.0233
0.0223
0.0213
0.0203
0.0193
0.0183
0.0173
0.0163
North
South
REGION

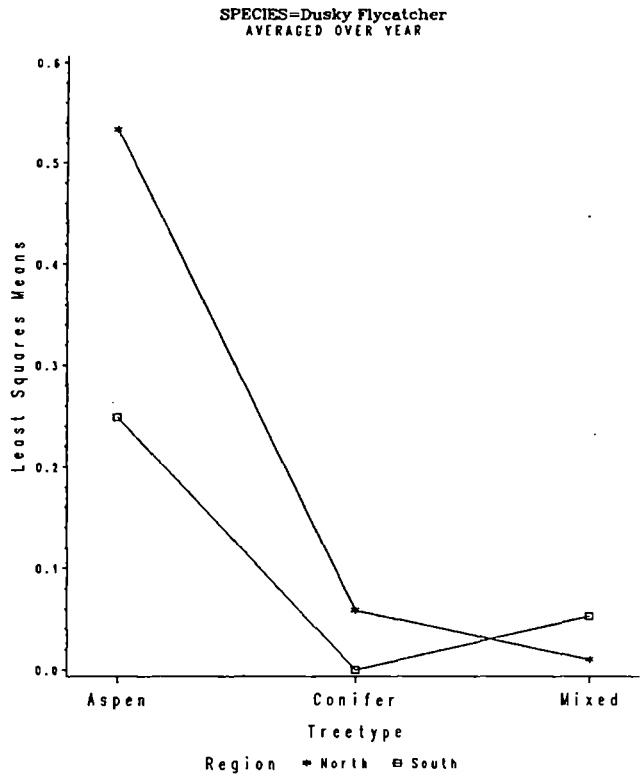
Fig. 13. Least squares means for Dusky Flycatcher in 6 habitats.

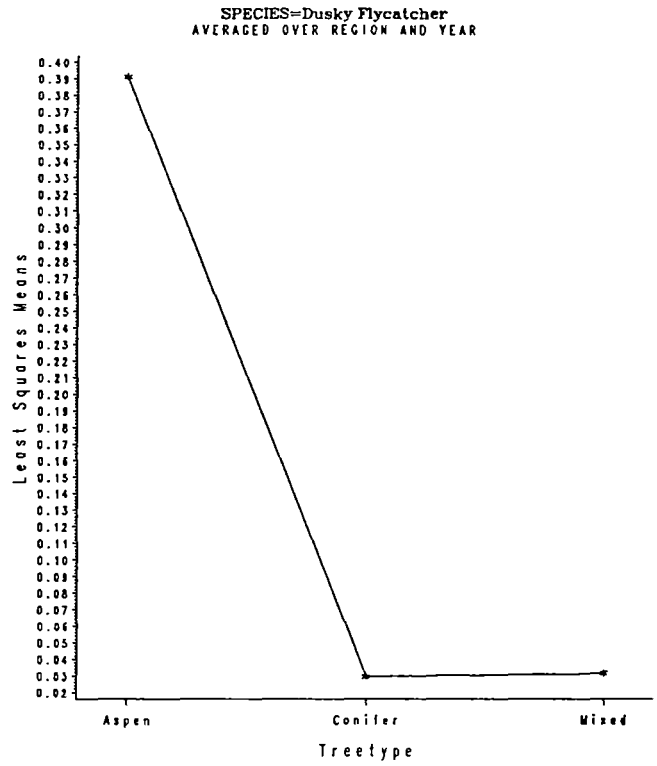









SPECIES=Dusky Flycatcher
AVERAGED OVER YEAR
Least Squares Means
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Aspen
Conifer
Mixed
Treetype
Region * North ⊟ South


SPECIES=Dusky Flycatcher
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

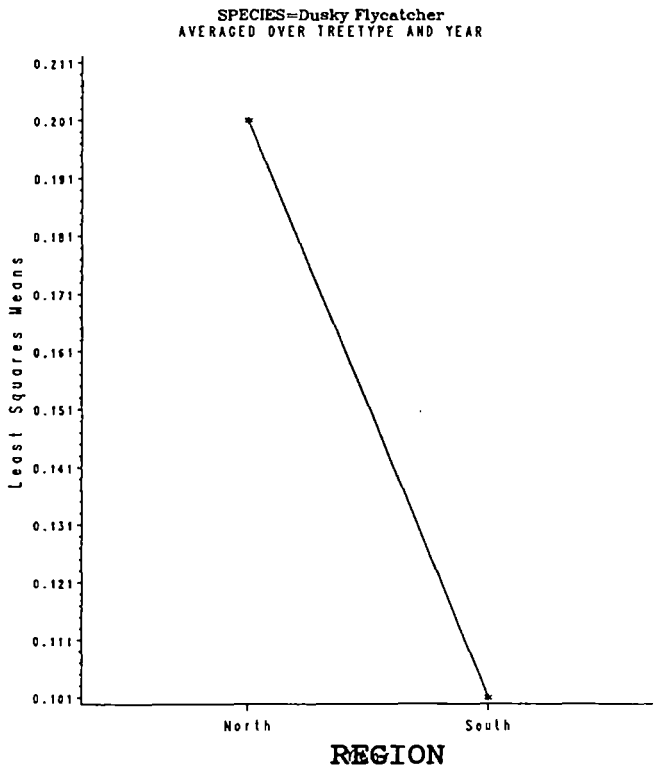
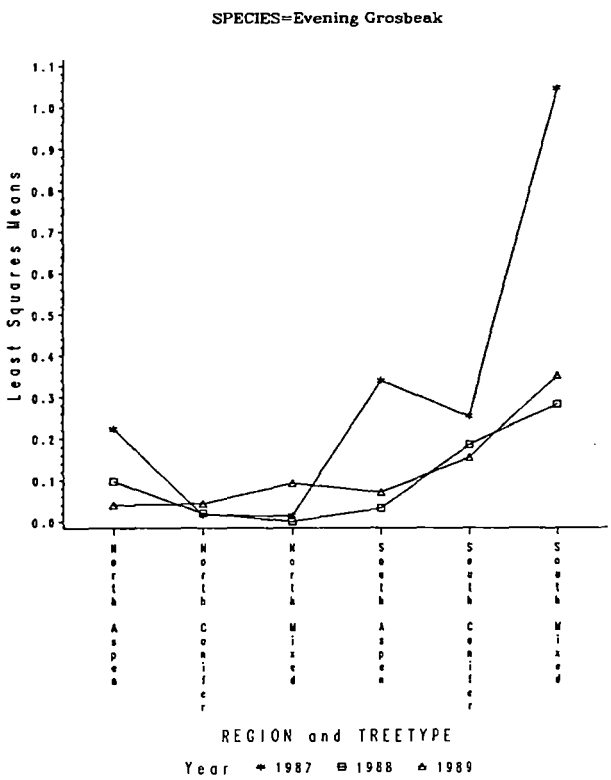
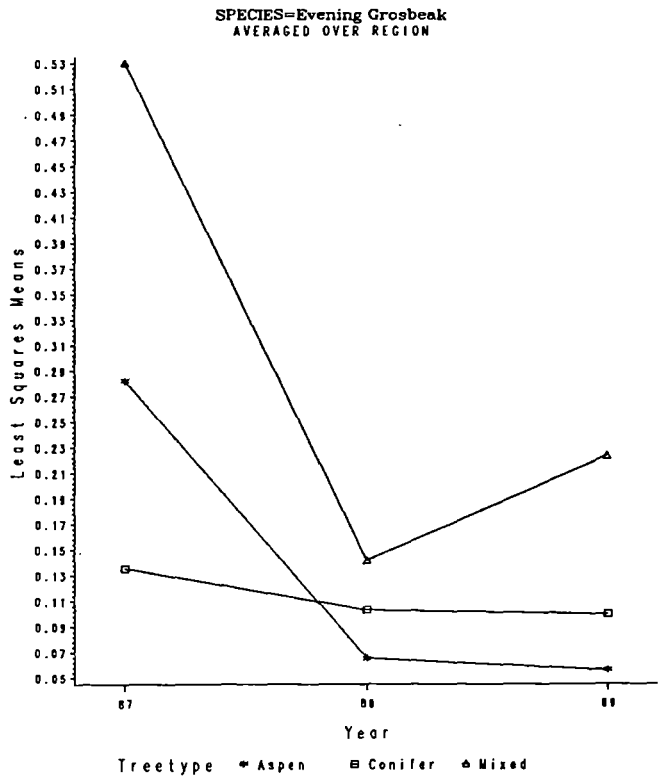
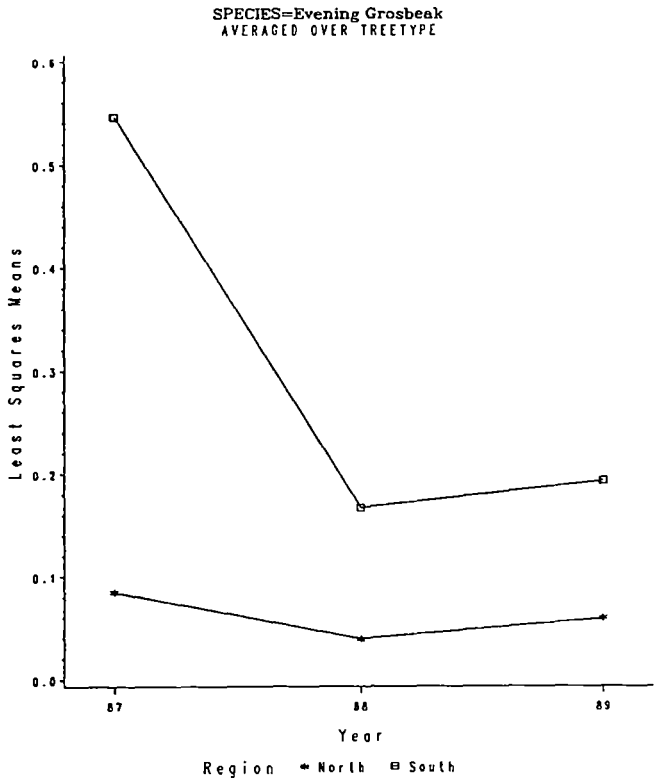
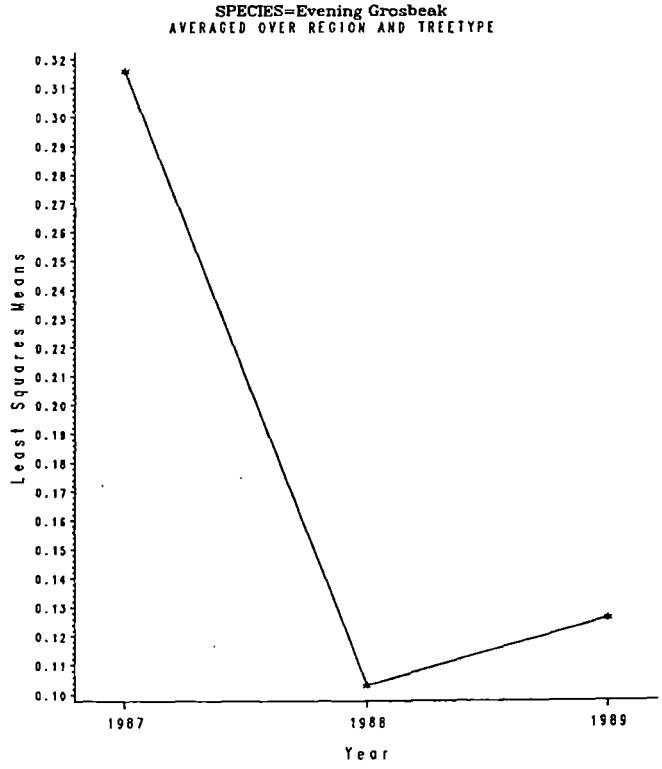

SPECIES=Dusky Flycatcher
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
0.211
0.201
0.191
0.181
0.171
0.161
0.151
0.141
0.131
0.121
0.111
0.101
North
South
REGION

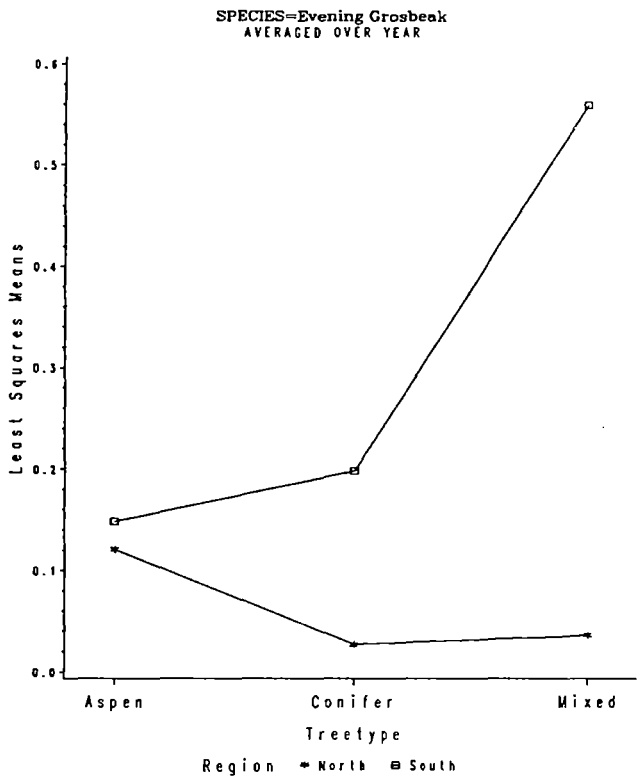
Fig. 14. Least squares means for Evening Grosbeak in 6 habitats.

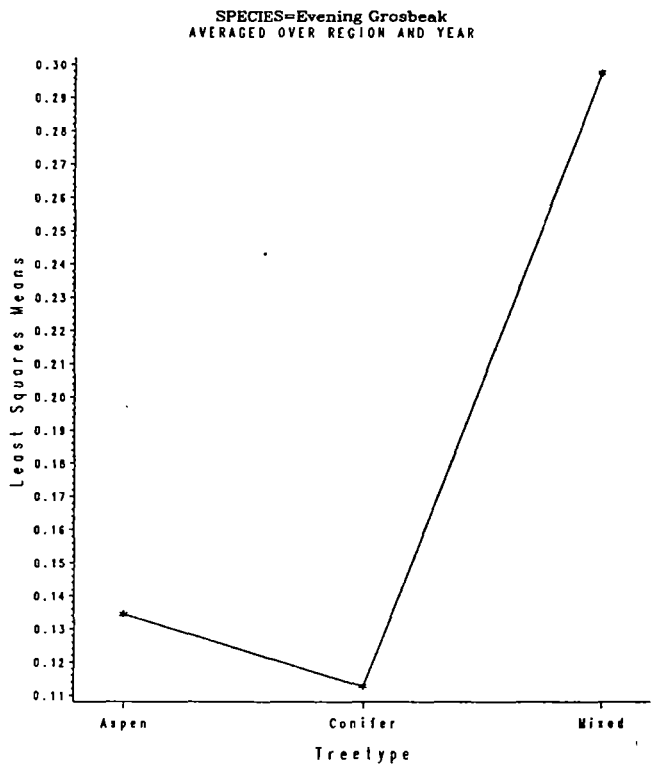









SPECIES=Evening Grosbeak
AVERAGED OVER YEAR
Least Squares Means
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Evening Grosbeak
AVERAGED OVER REGION AND YEAR
Least Squares Means
0.30
0.29
0.28
0.27
0.26
0.25
0.24
0.23
0.22
0.21
0.20
0.19
0.18
0.17
0.16
0.15
0.14
0.13
0.12
0.11
Aspen
Conifer
Mixed
Treetype

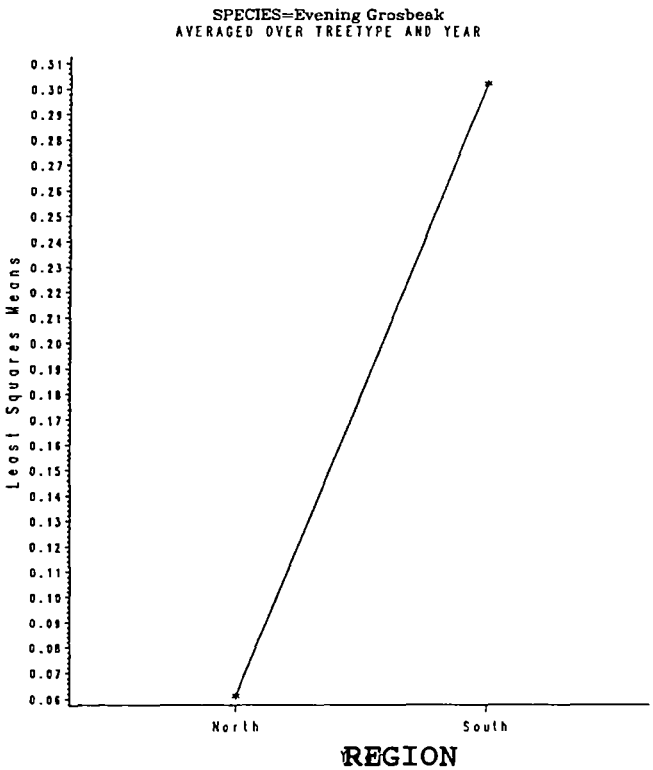
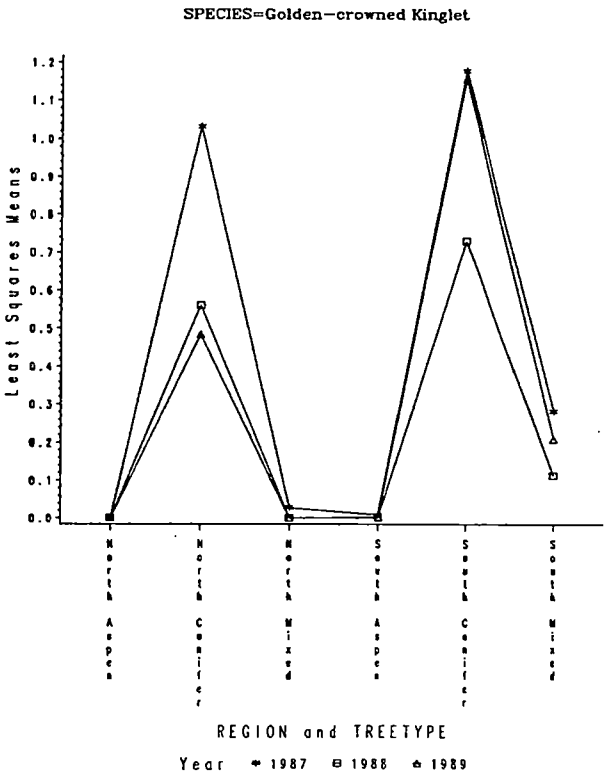
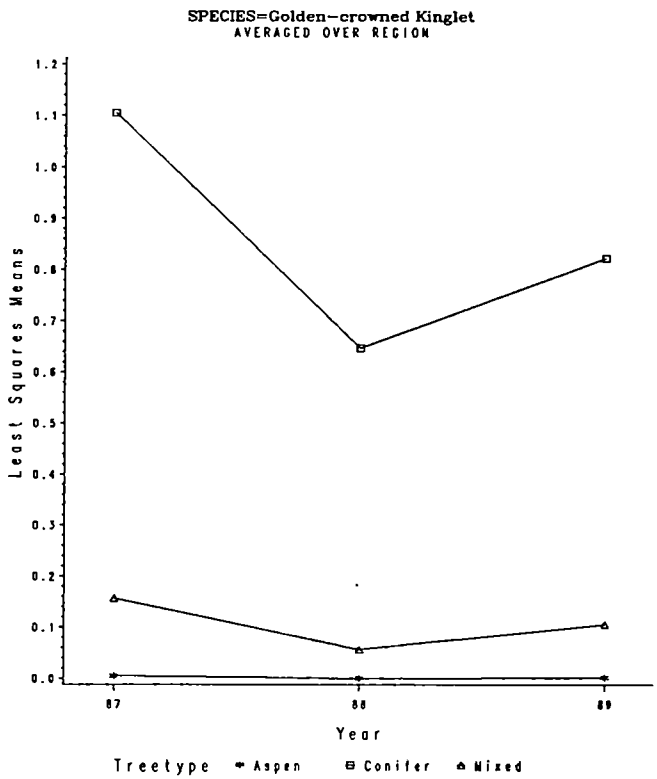
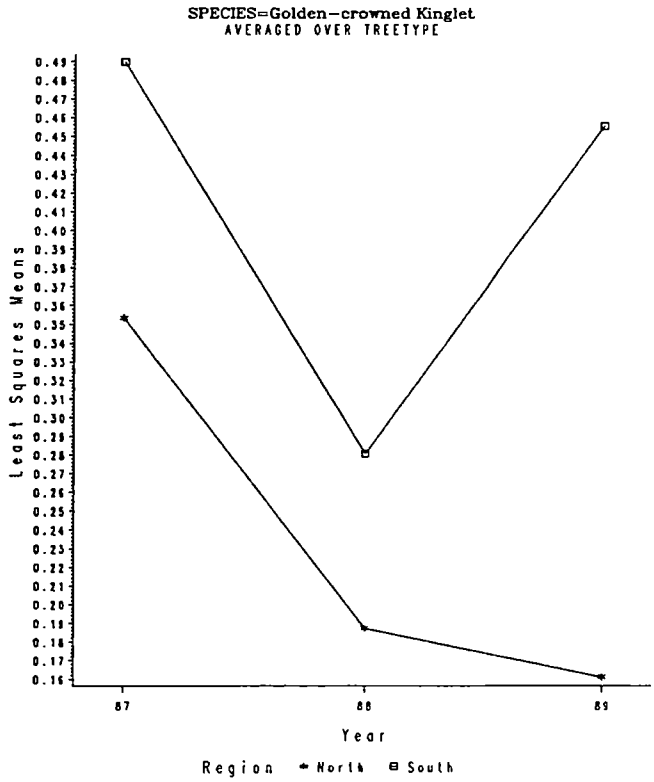

SPECIES=Evening Grosbeak
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
0.31
0.30
0.29
0.28
0.27
0.26
0.25
0.24
0.23
0.22
0.21
0.20
0.19
0.18
0.17
0.16
0.15
0.14
0.13
0.12
0.11
0.10
0.09
0.08
0.07
0.06
North
South
REGION

Fig. 15. Least squares means for Golden-crowned Kinglet in 6 habitats.







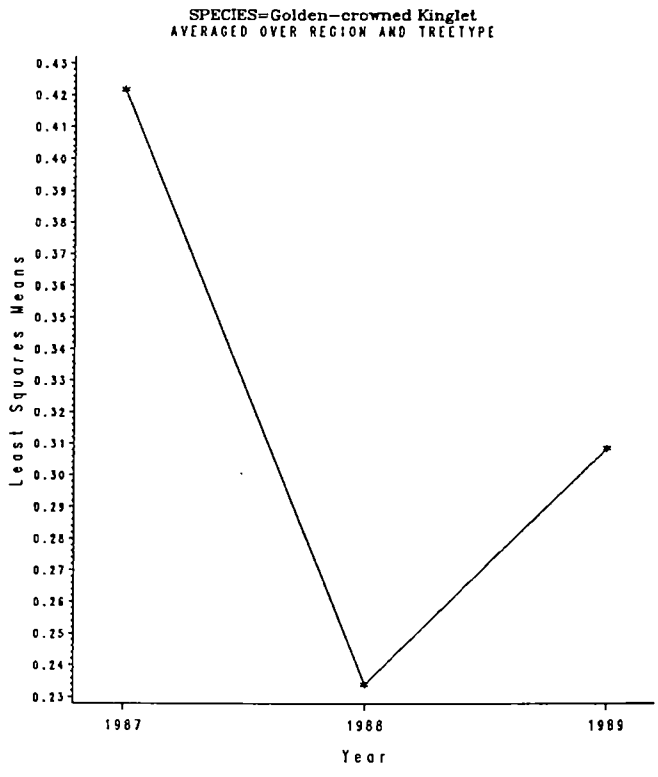
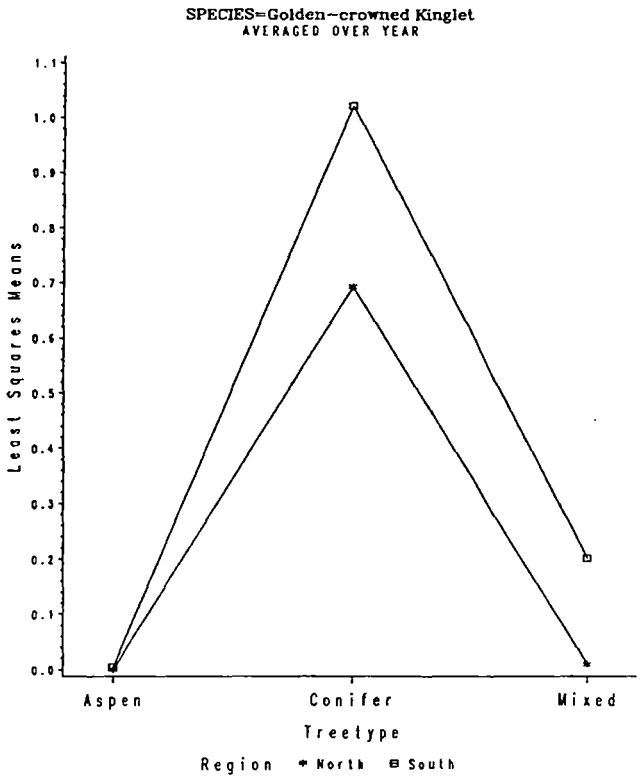
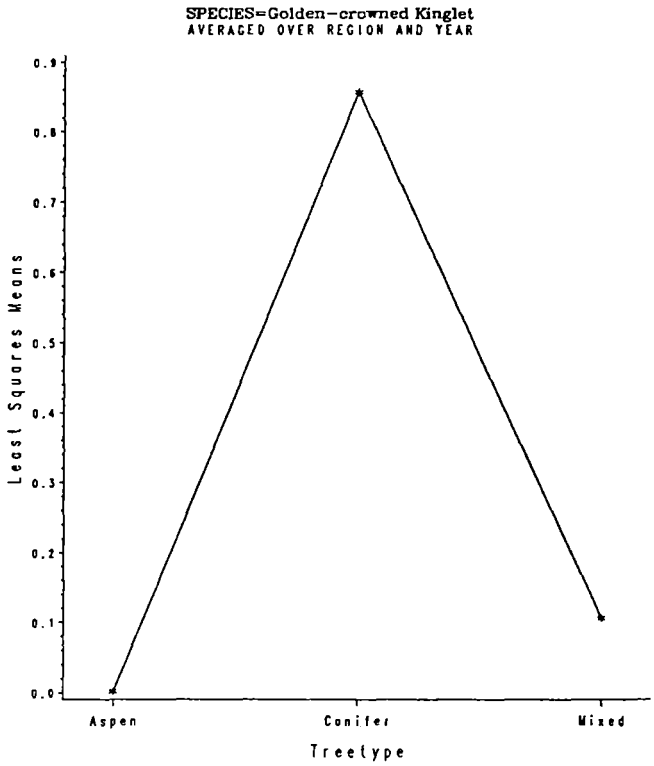


Fig. 15 (cont).


SPECIES=Golden-crowned Kinglet
AVERAGED OVER YEAR
Least Squares Means
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Golden-crowned Kinglet
AVERAGED OVER REGION AND YEAR
Least Squares Means
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Aspen
Conifer
Mixed
Treetype

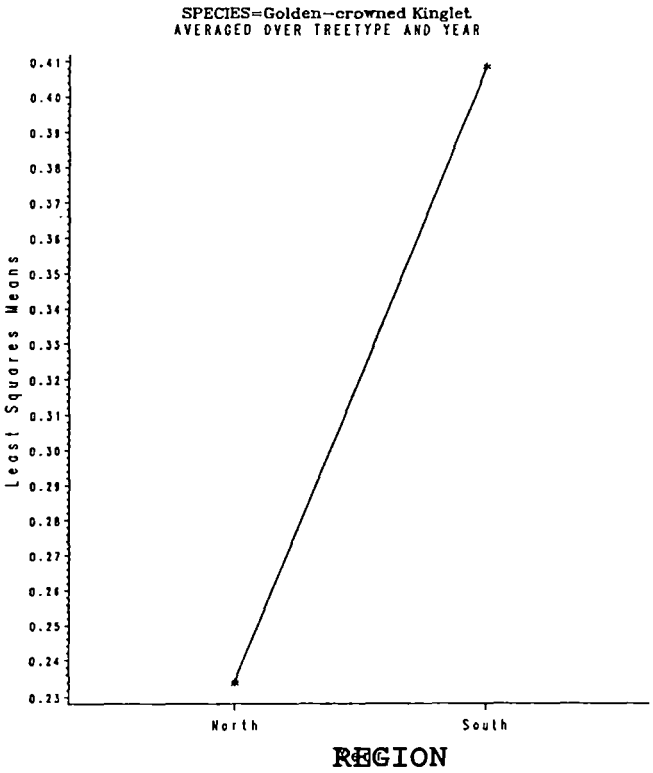
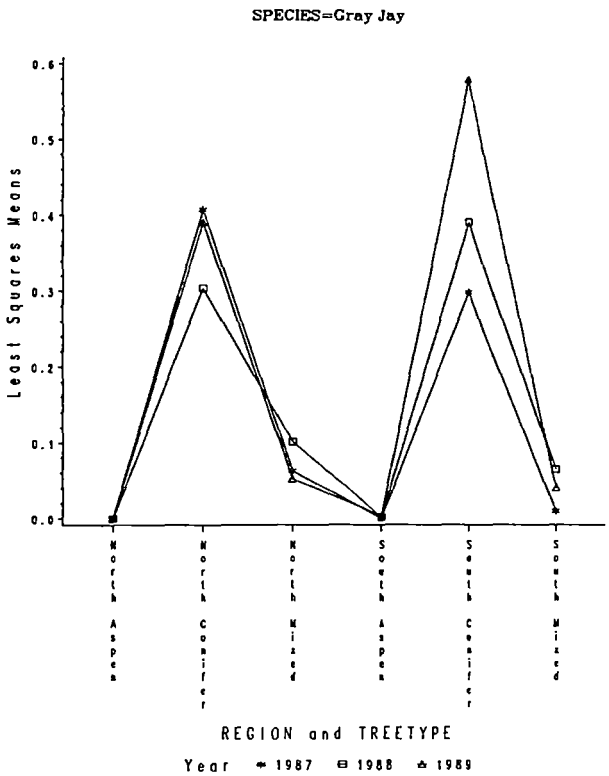
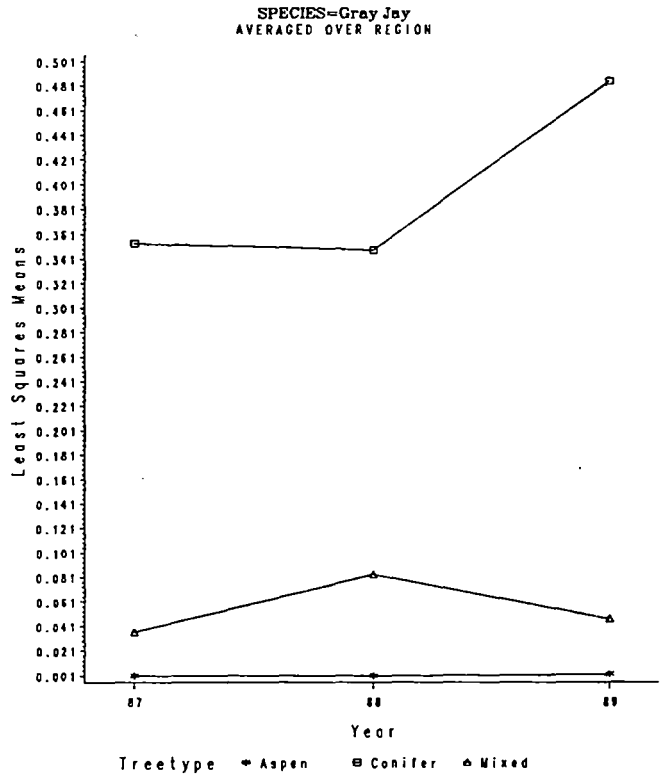
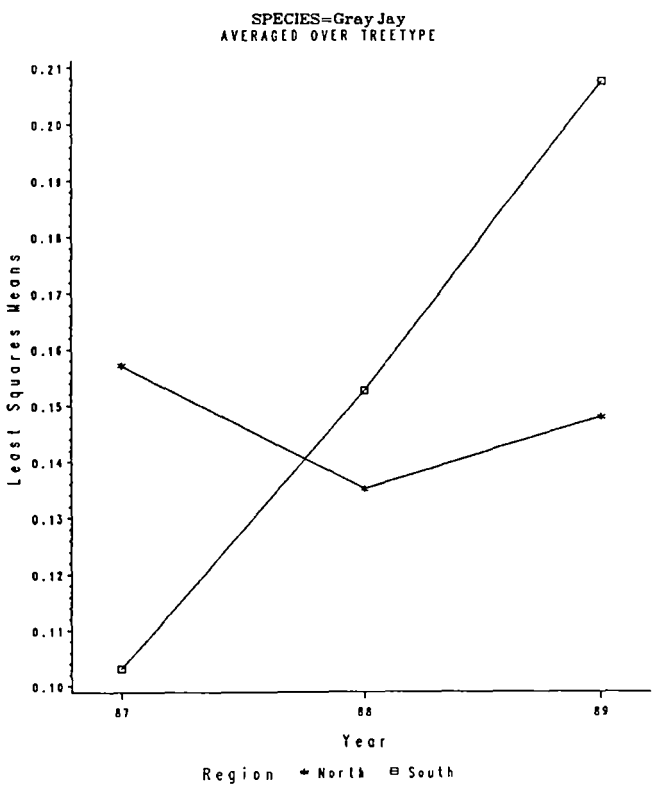

SPECIES=Golden-crowned Kinglet
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
0.41
0.40
0.39
0.38
0.37
0.36
0.35
0.34
0.33
0.32
0.31
0.30
0.29
0.28
0.27
0.26
0.25
0.24
0.23
North
South
REGION

Fig. 16. Least squares means for Gray Jayin 6 habitats.







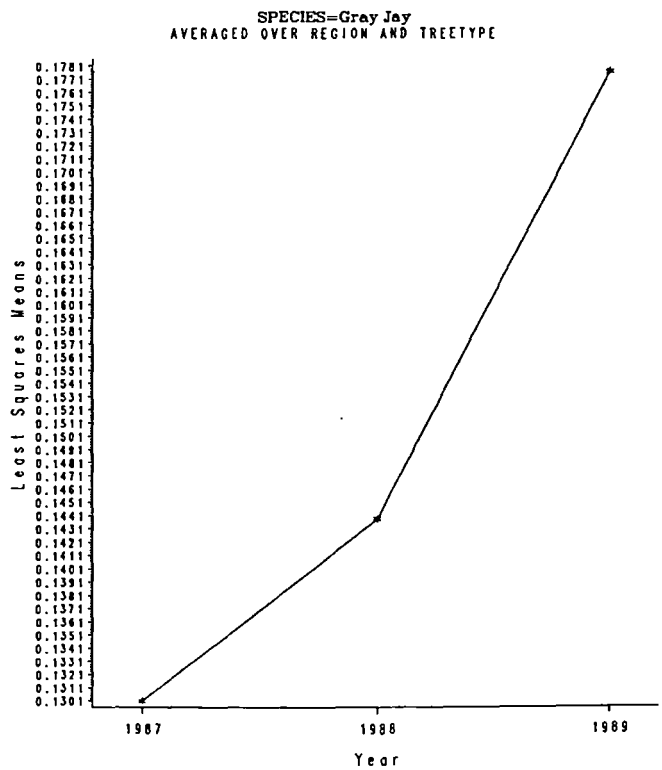
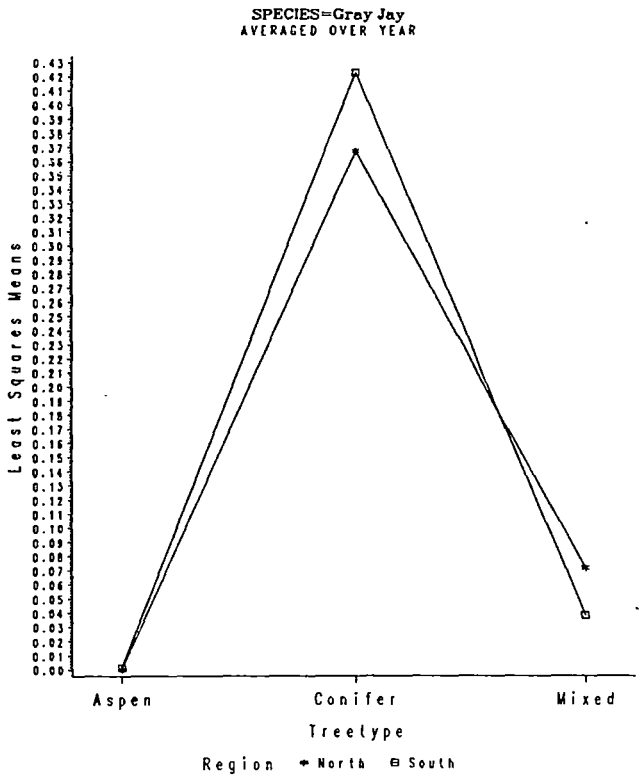
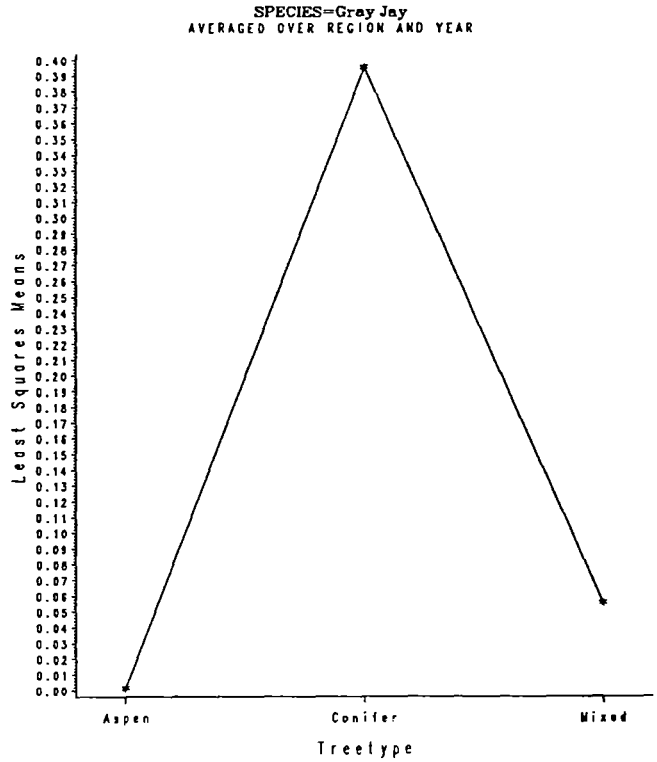


Fig. 16 (cont).


SPECIES=Gray Jay
AVERAGED OVER YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Gray Jay
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

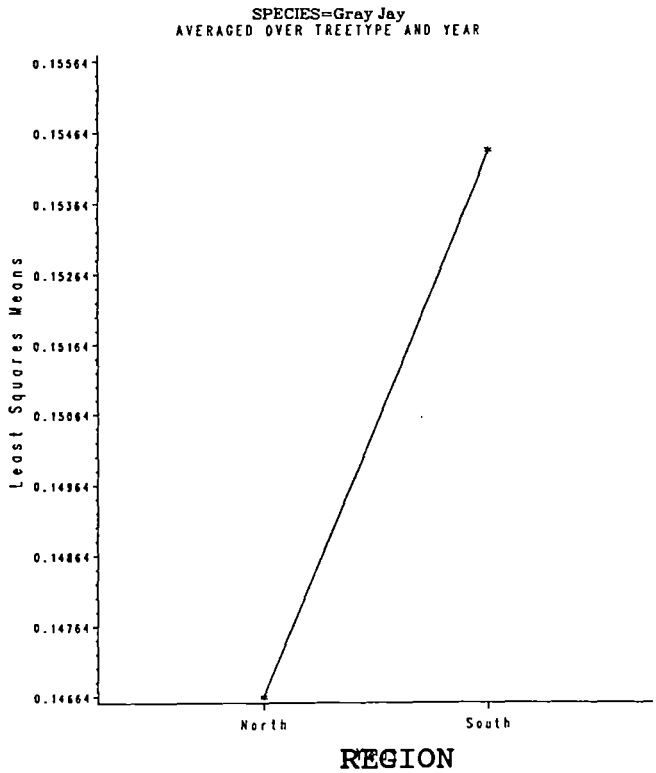
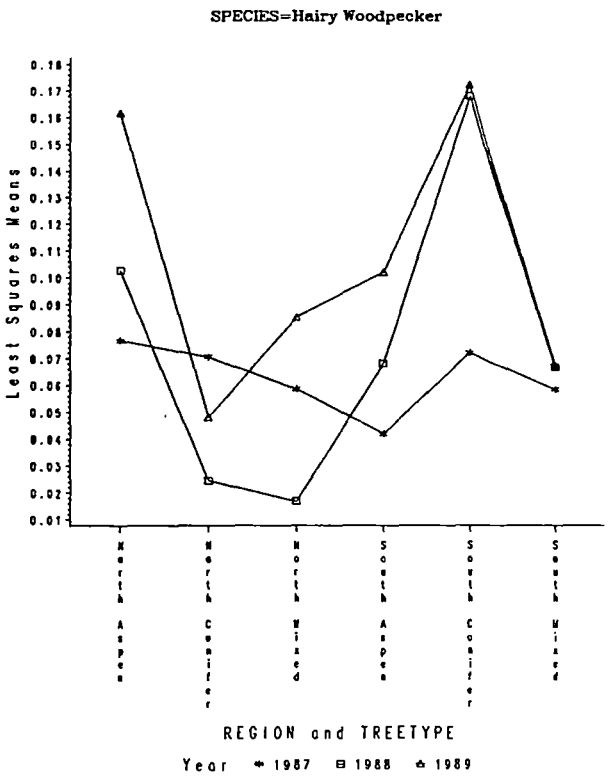
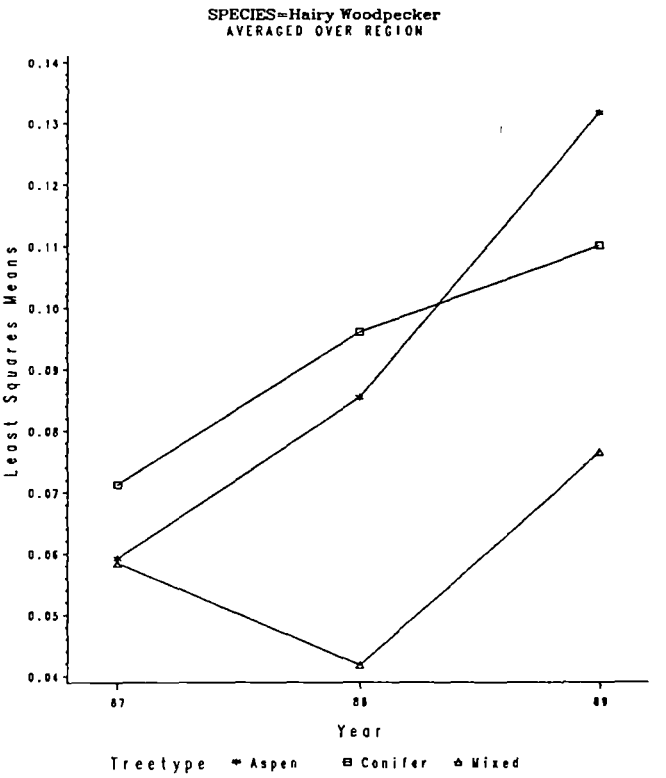
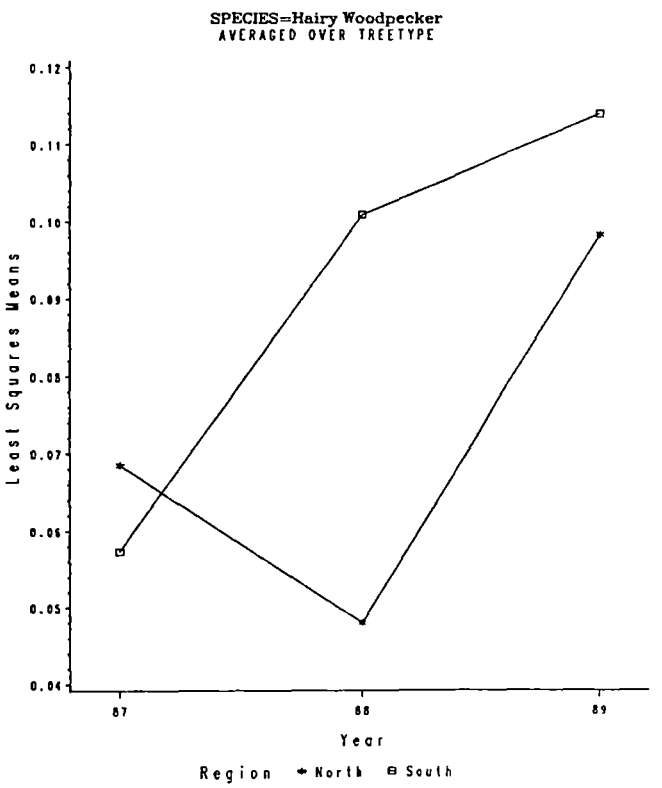
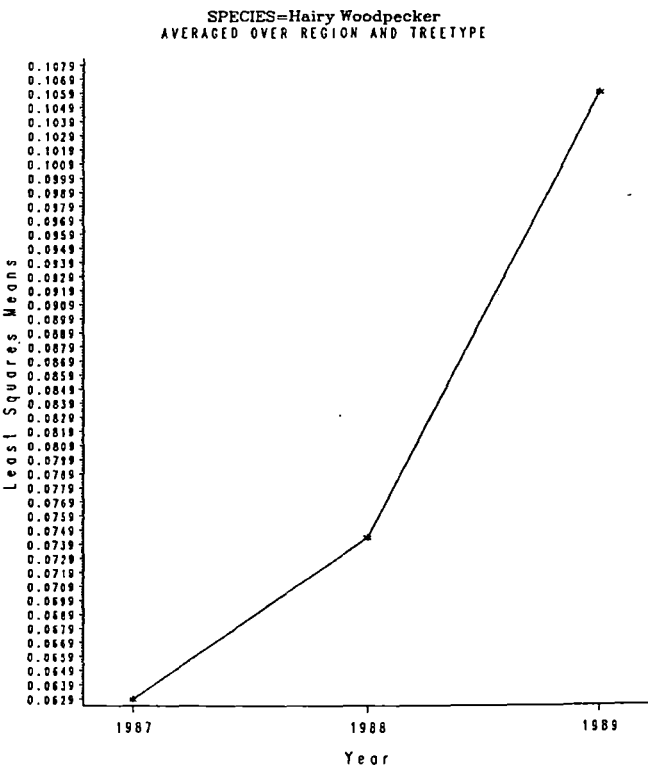

SPECIES=Gray Jay
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
0.15564
0.15464
0.15364
0.15264
0.15164
0.15064
0.14964
0.14864
0.14764
0.14664
North
South
REGION

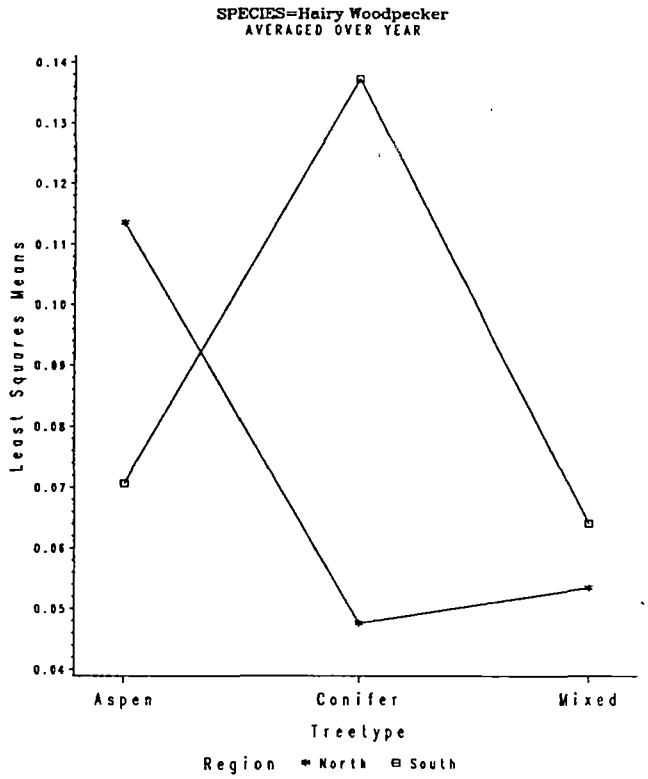
Fig. 17. Least squares means for Hairy Woodpecker in 6 habitats.

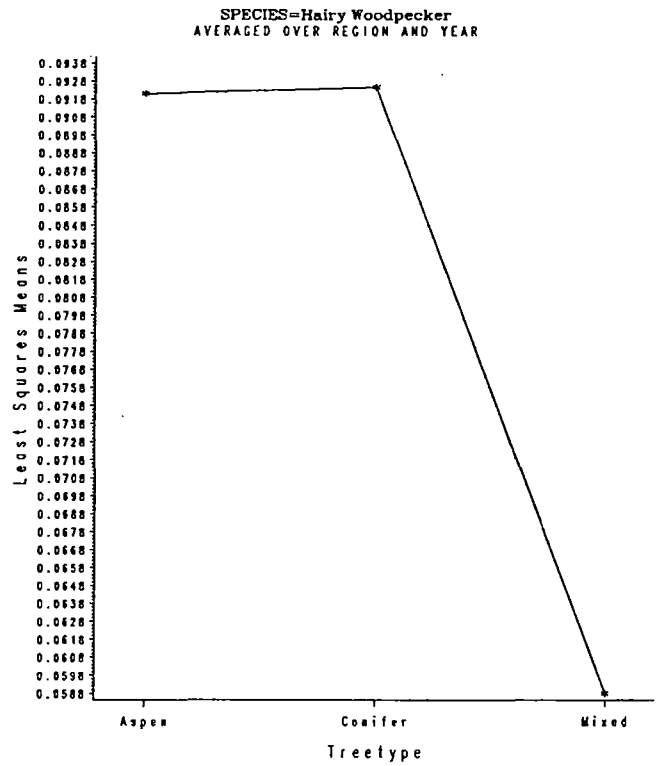









SPECIES=Hairy Woodpecker
AVERAGED OVER YEAR
Least Squares Means
0.14
0.13
0.12
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
Aspen
Conifer
Mixed
Treetype
Region
North
South


SPECIES=Hairy Woodpecker
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

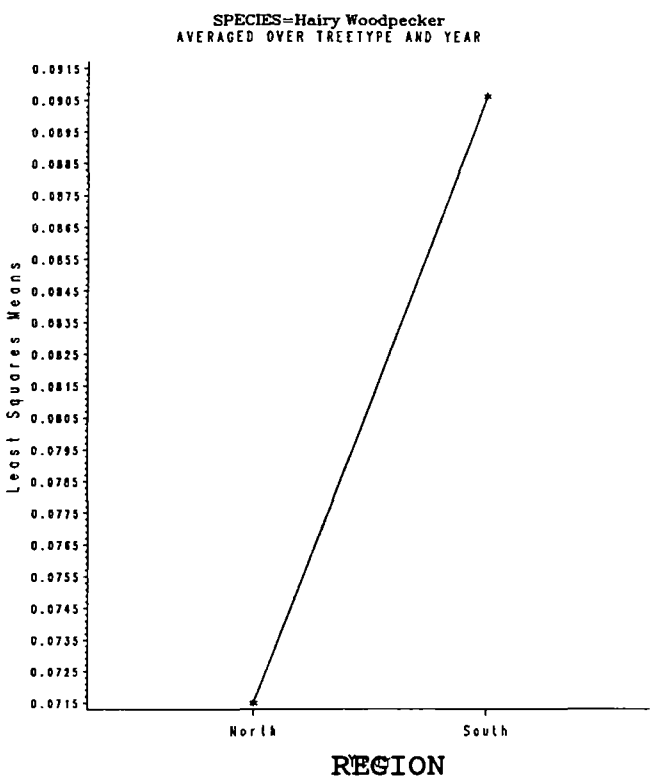
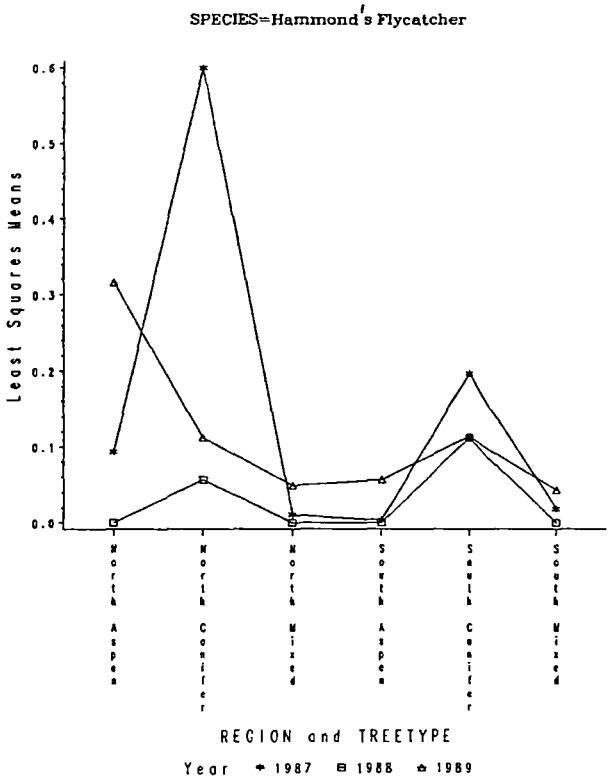
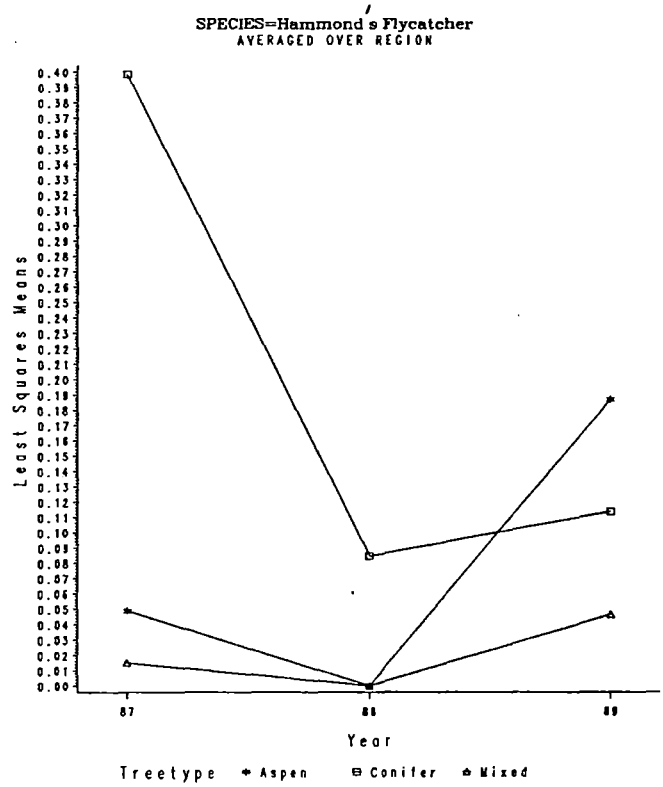
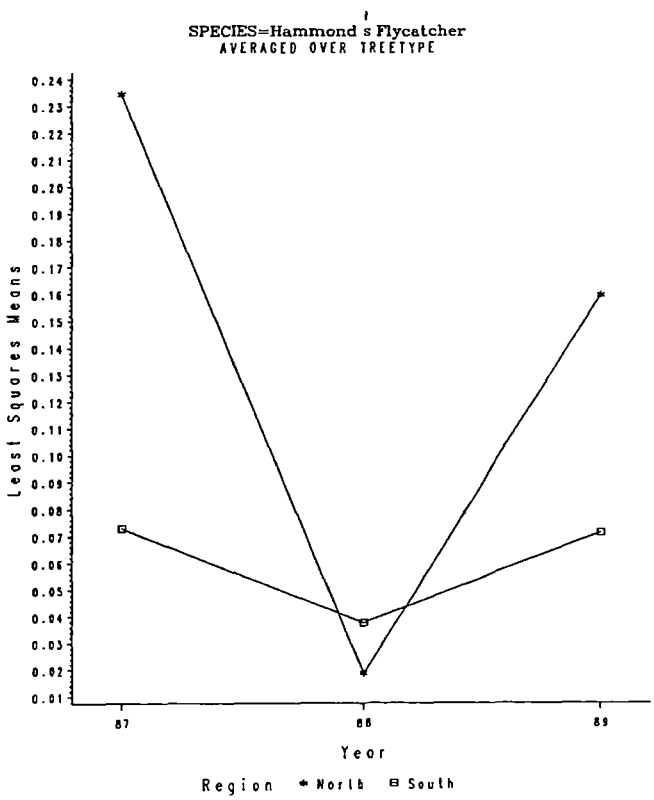

SPECIES=Hairy Woodpecker
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
0.0915
0.0905
0.0895
0.0885
0.0875
0.0865
0.0855
0.0845
0.0835
0.0825
0.0815
0.0805
0.0795
0.0785
0.0775
0.0765
0.0755
0.0745
0.0735
0.0725
0.0715
North
South
REGION

Fig. 18. Least squares means for Hammond's Flycatchler in 6 habitats.







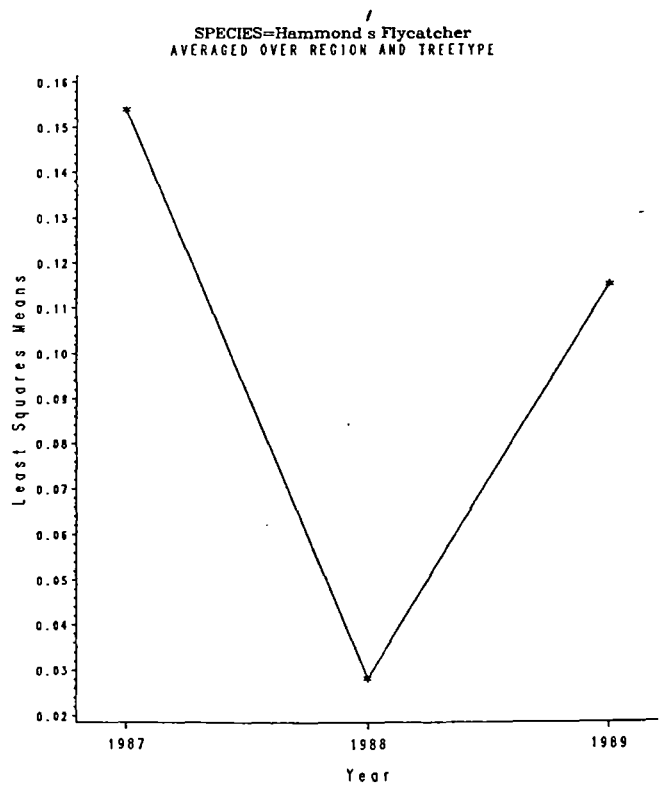
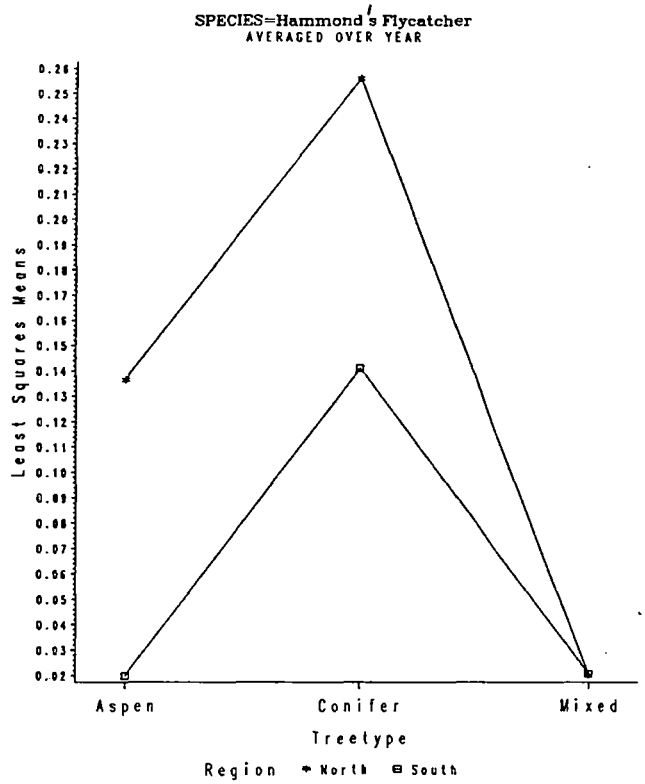
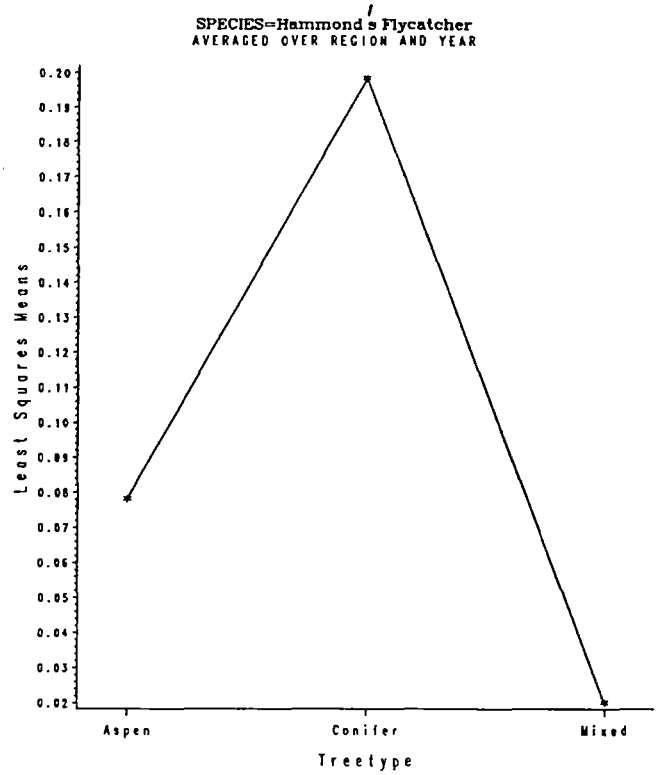


Fig. 18 (cont).


SPECIES=Hammond's Flycatcher
AVERAGED OVER YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Hammond's Flycatcher
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

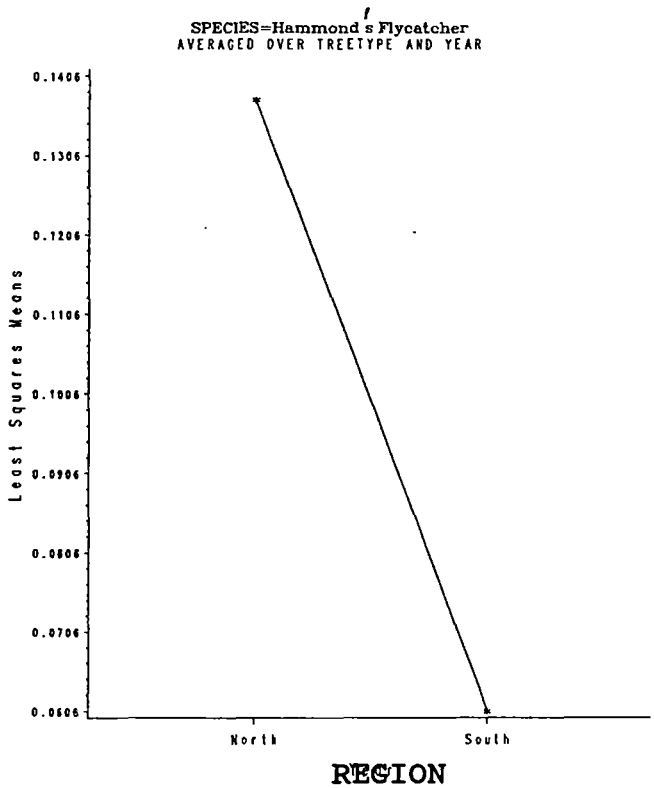
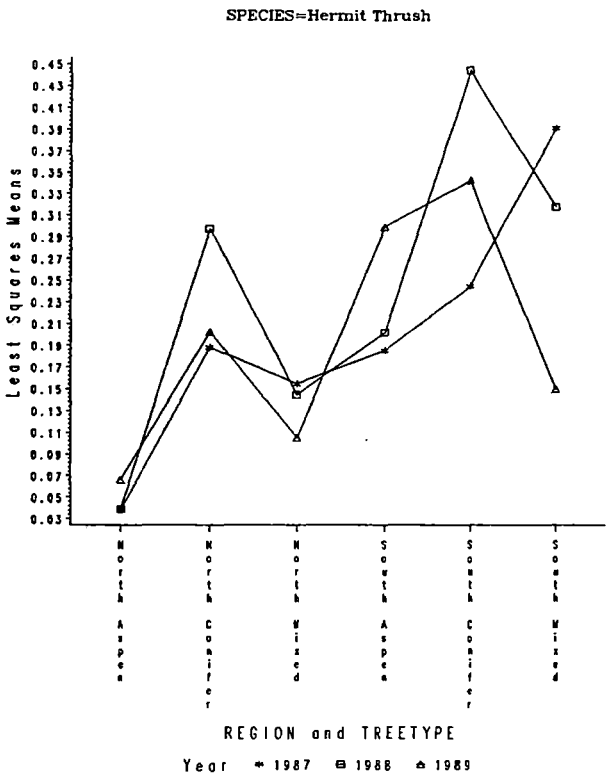
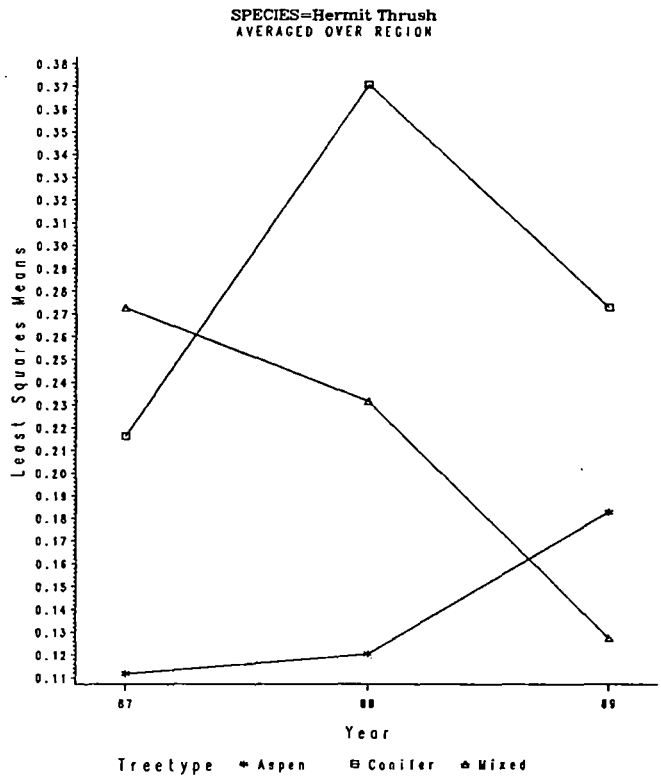

SPECIES=Hammond's Flycatcher
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

Fig. 19. Least squares means for Hermit Thrush in 6 habitats.

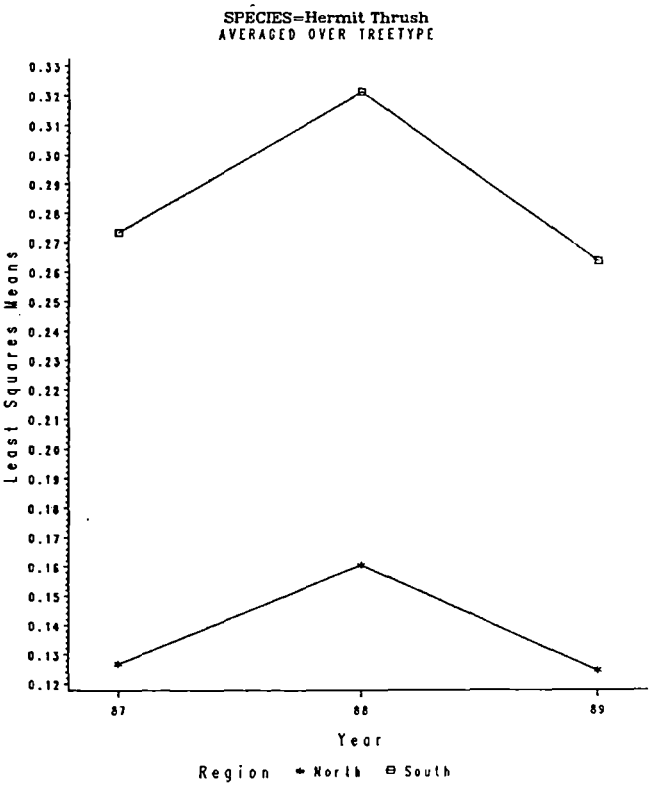
a. Year by region by treetype interaction. (P < 0.67)



b. Year by treetype interaction. (P = 0..10



c. Year by region interaction. (P < 0..97)



d. Year main effect. (P = 0.51)

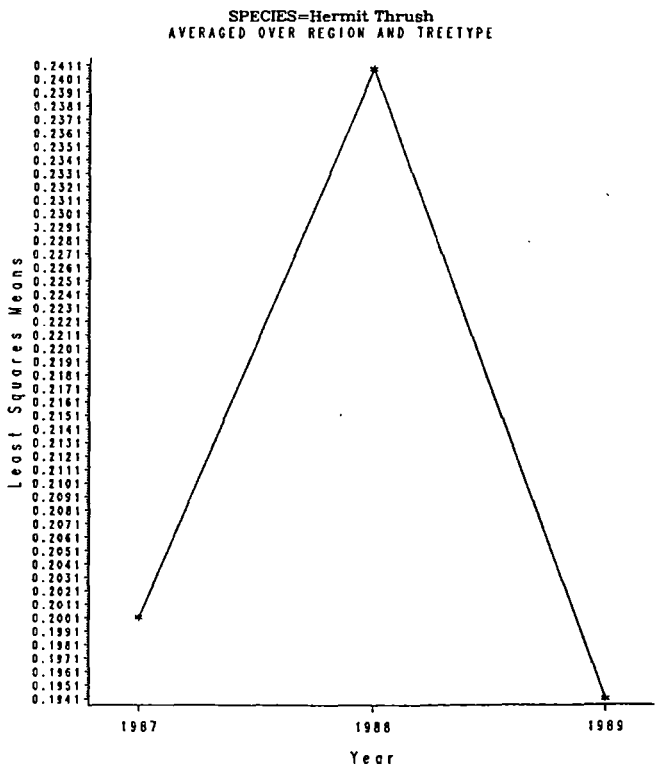
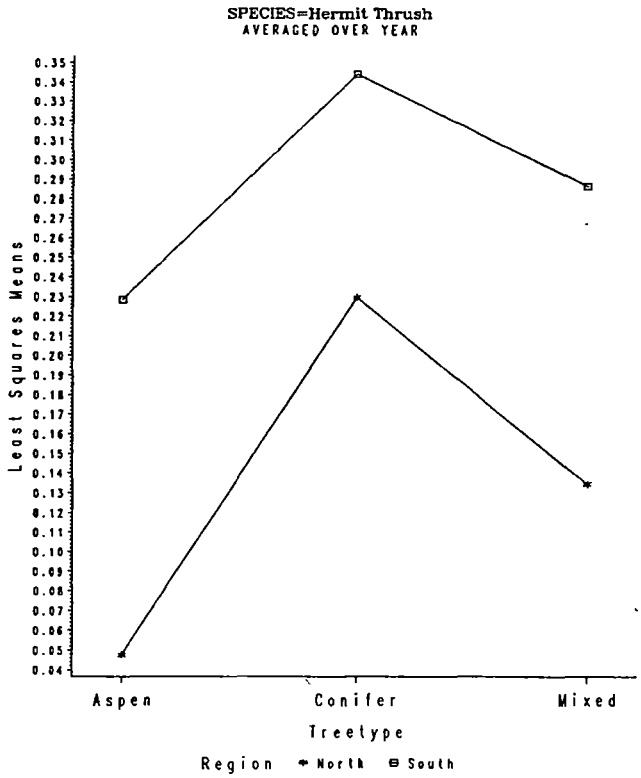
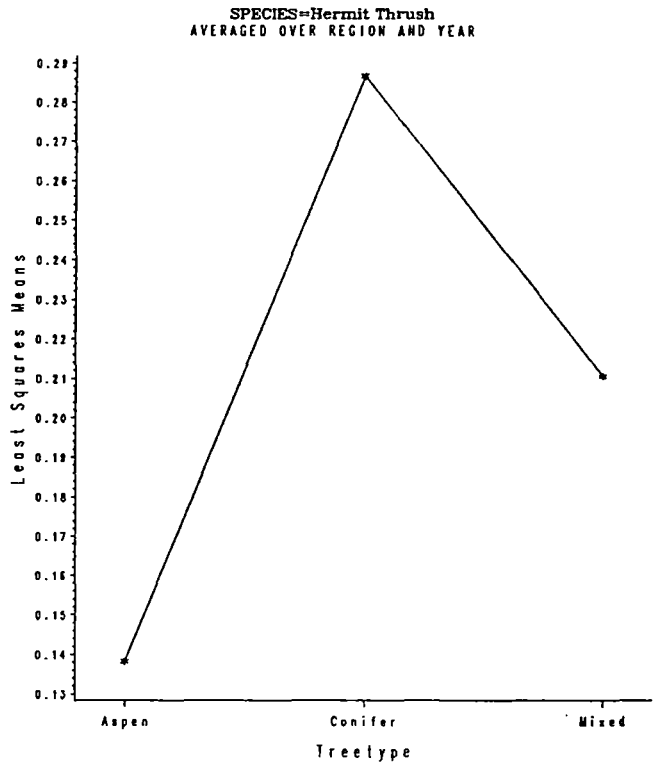


Fig. 19 (cont.).

e. Region by treetype interaction. (P = 0.69)



f. Treetype main effect. (P < 0.00)



g. Region main effect. (P < 0.00)

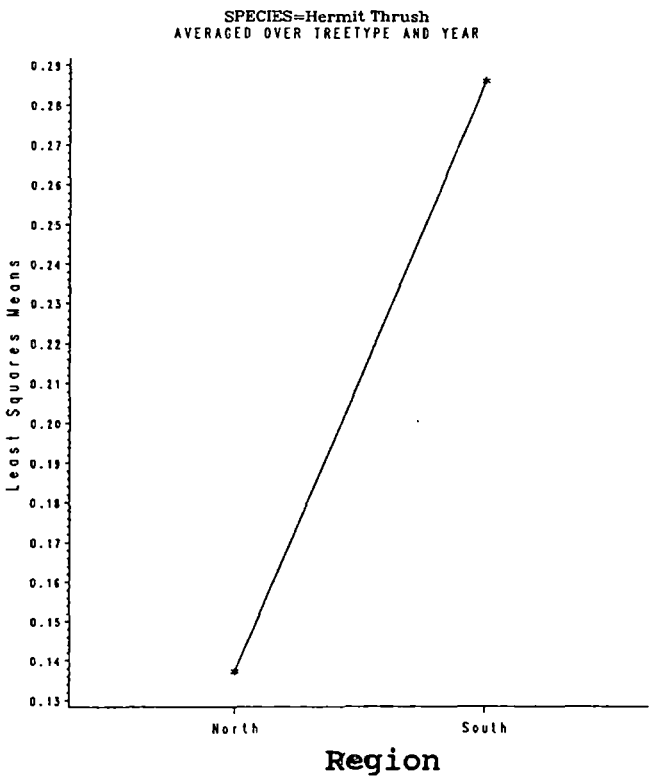
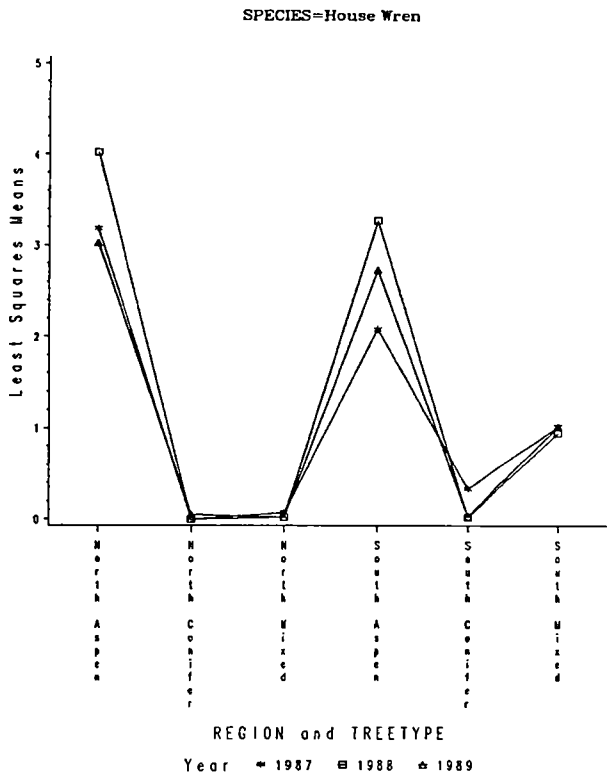
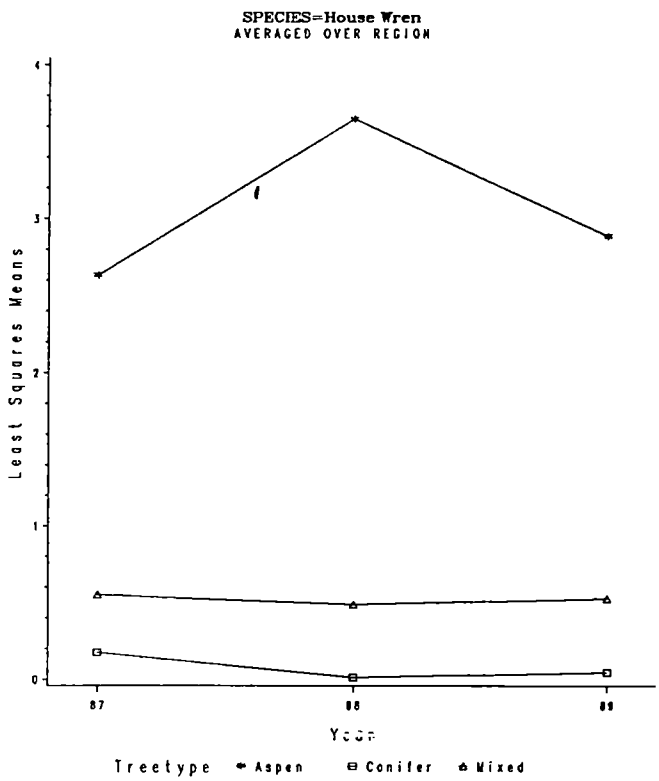
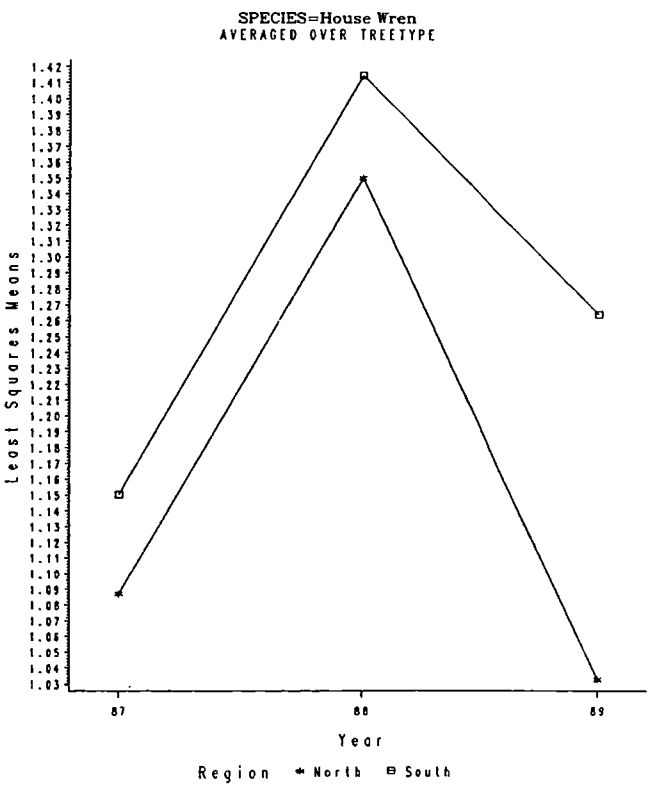


Fig. 20. Least squares means for House Wren in 6 habitats.







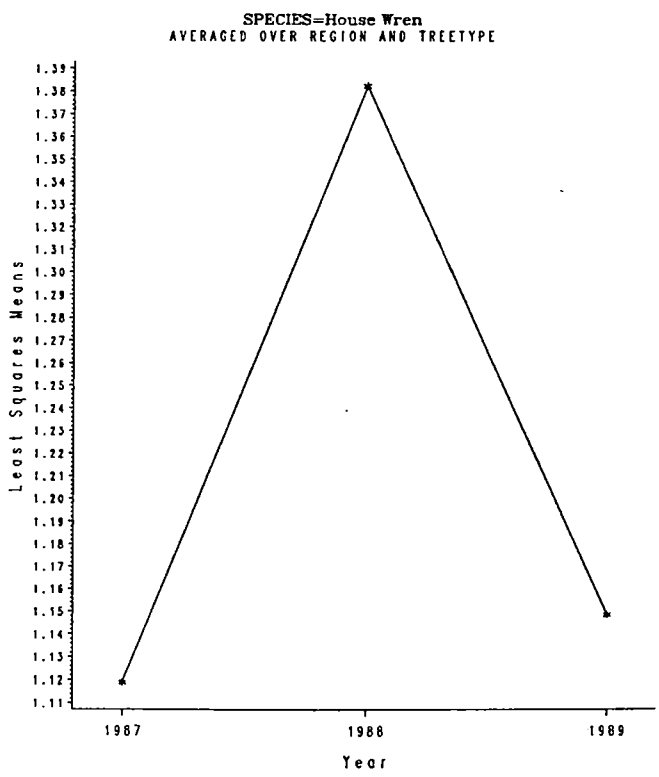
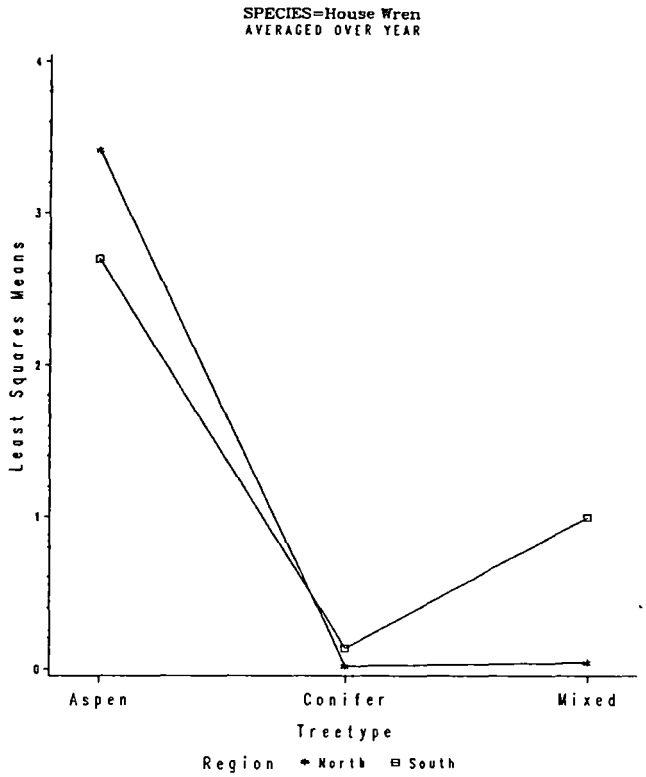
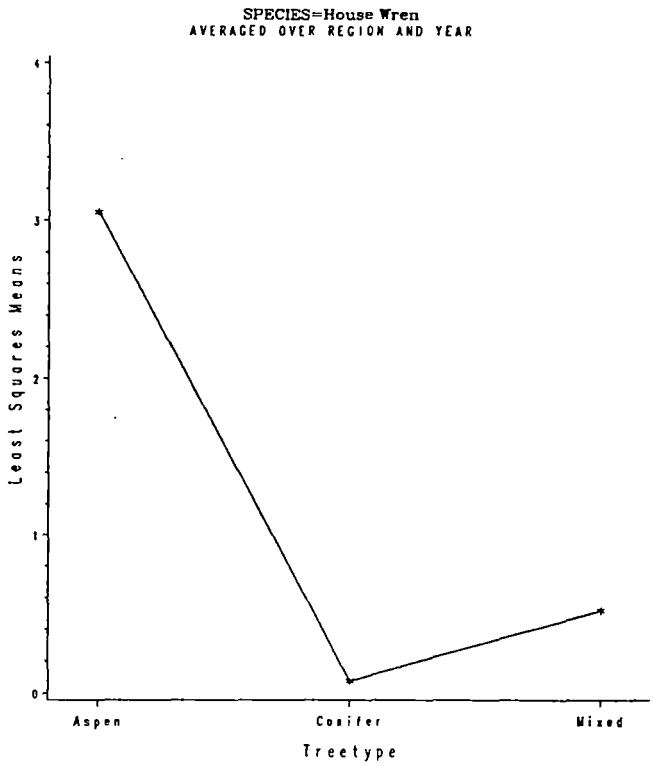


Fig. 20 (cont).


SPECIES=House Wren
AVERAGED OVER YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=House Wren
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

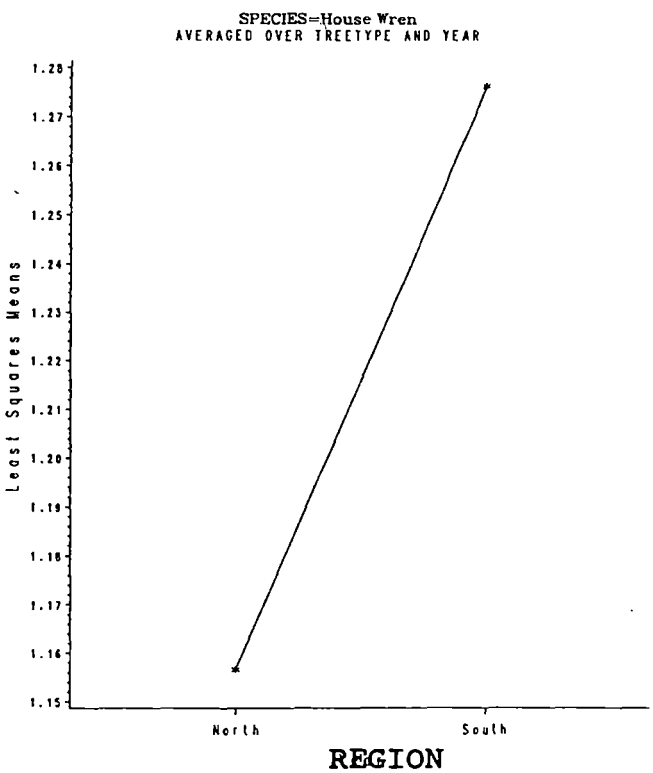

SPECIES=House Wren
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

Fig. 21. Least squares means for Lincoln's Sparrow in 6 habitats.

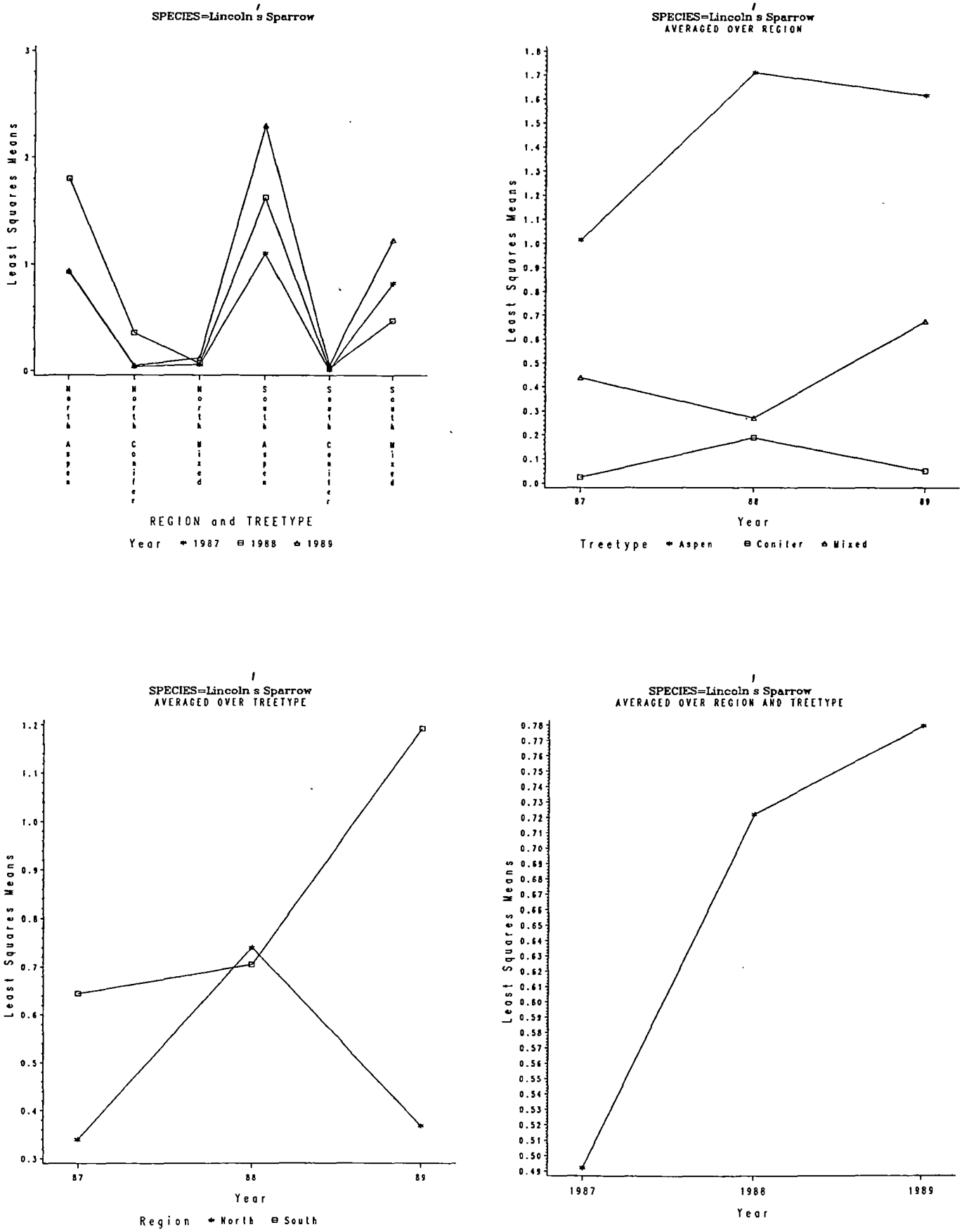
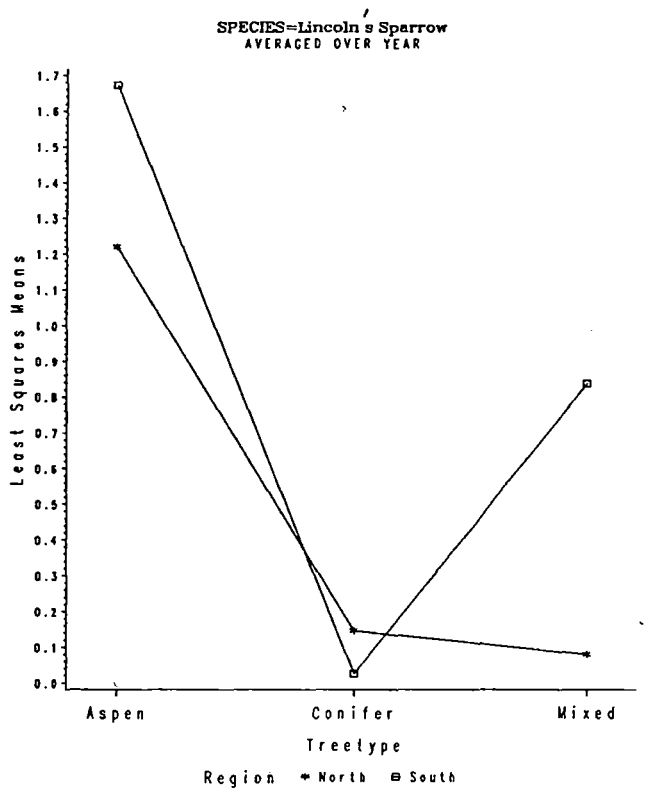
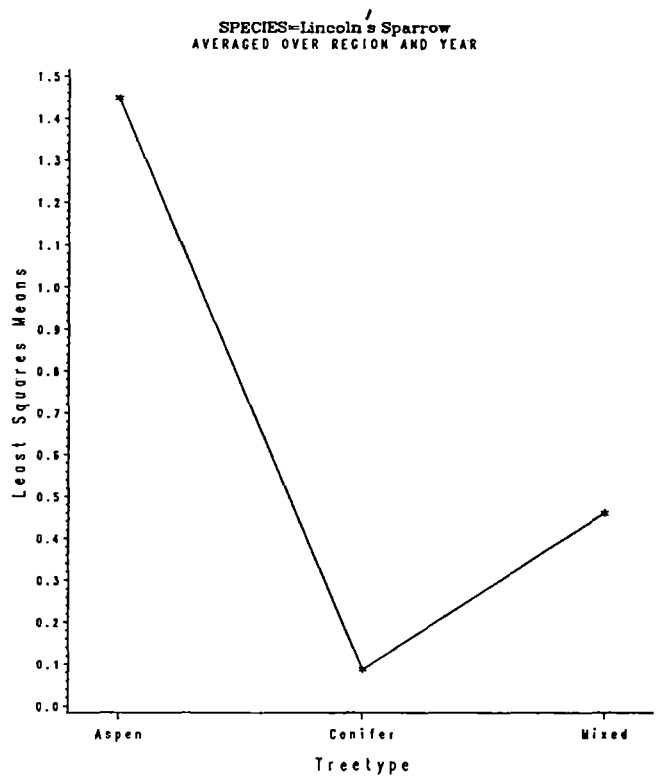


Fig. 21 (cont).


SPECIES=Lincoln s Sparrow
AVERAGED OVER YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype
Region * North ⊟ South


SPECIES=Lincoln s Sparrow
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

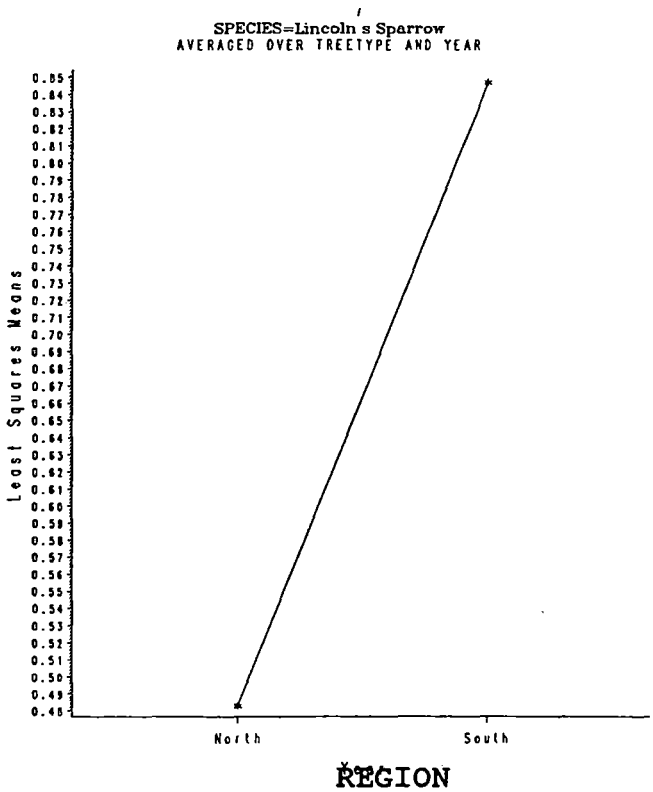

SPECIES=Lincoln s Sparrow
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

Fig. 22. Least squares means for MacGillivray's Warbler in 6 habitats.

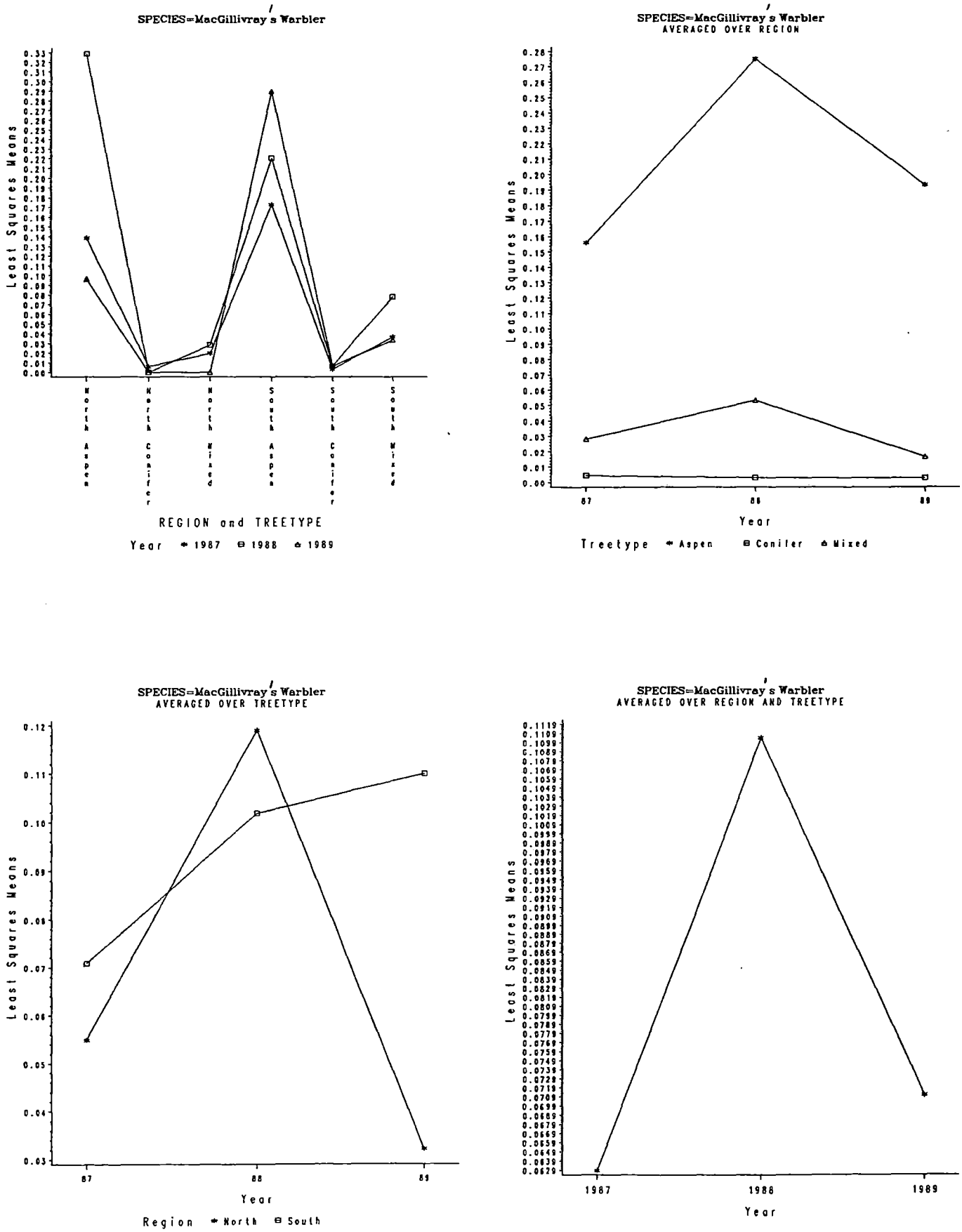
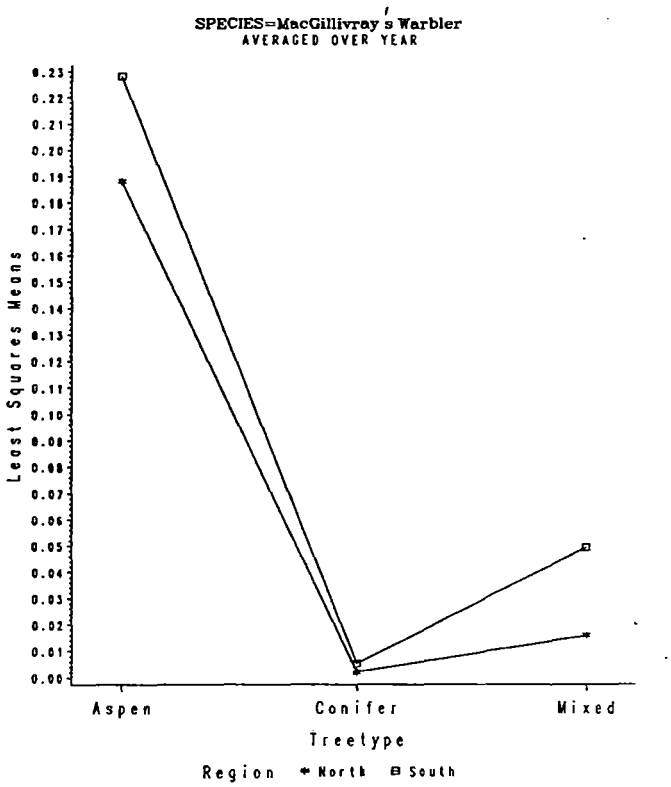
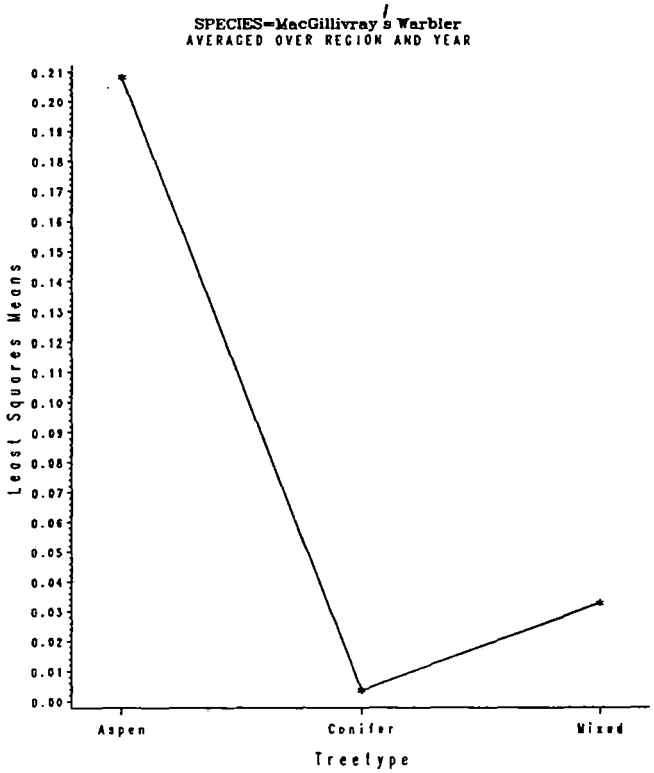


Fig. 22 (cont).


SPECIES=MacGillivray's Warbler
AVERAGED OVER YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=MacGillivray's Warbler
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

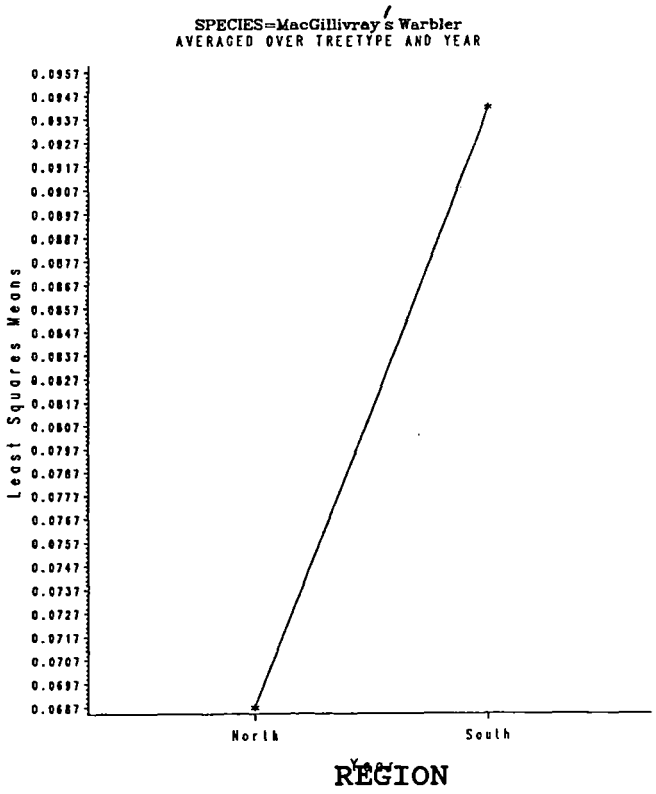
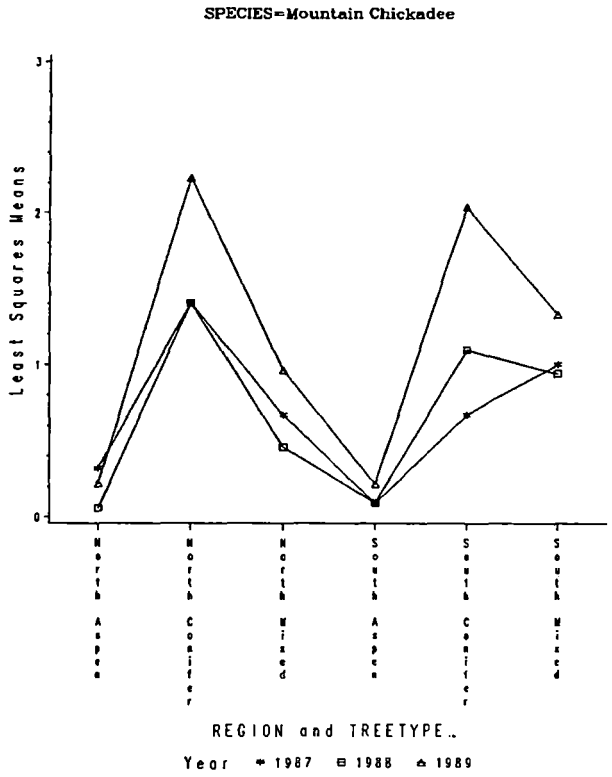
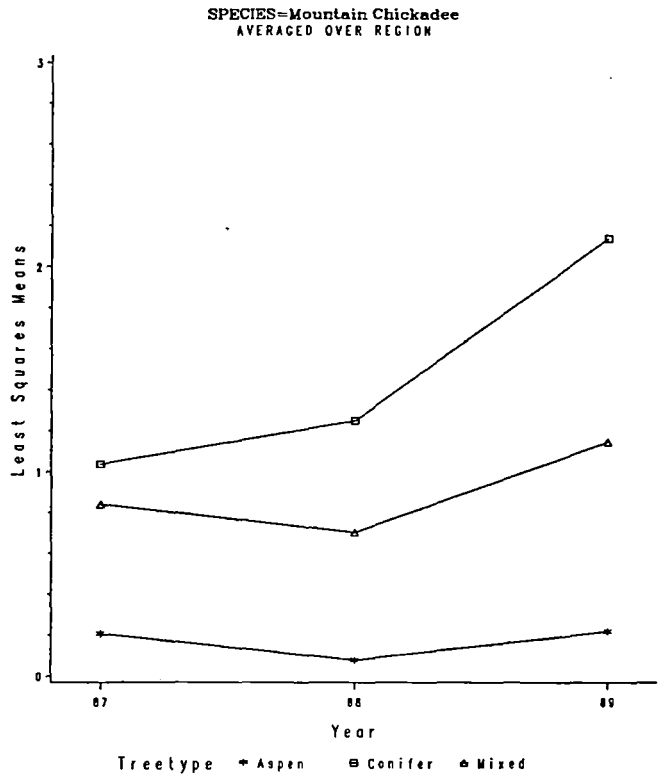
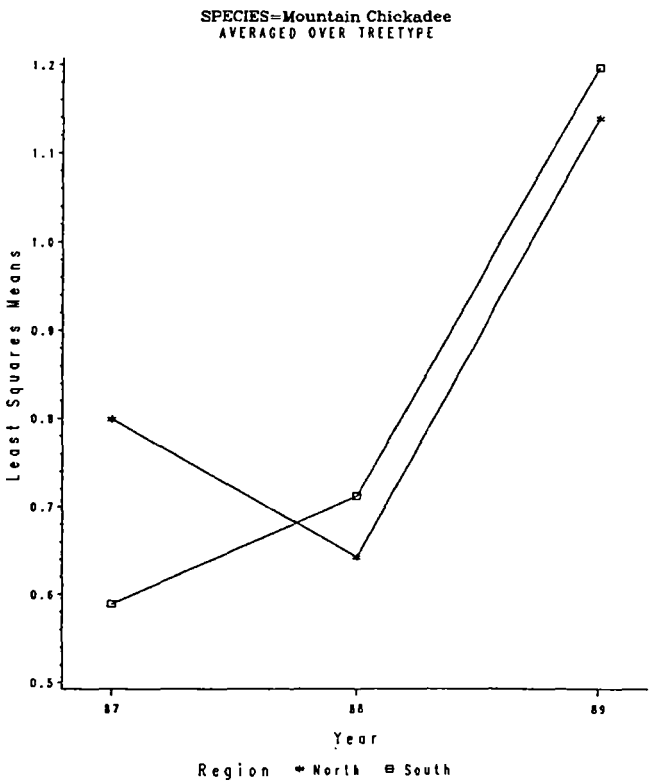
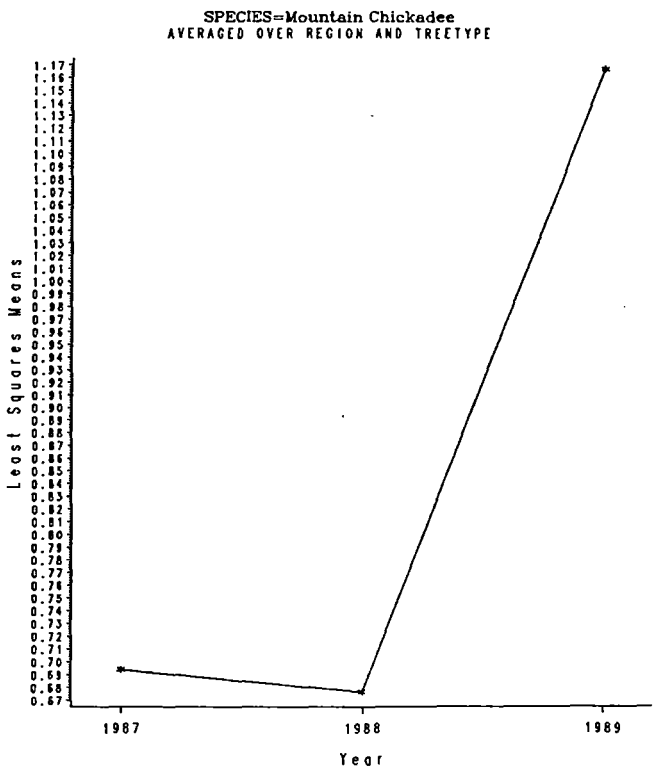

SPECIES=MacGillivray's Warbler
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

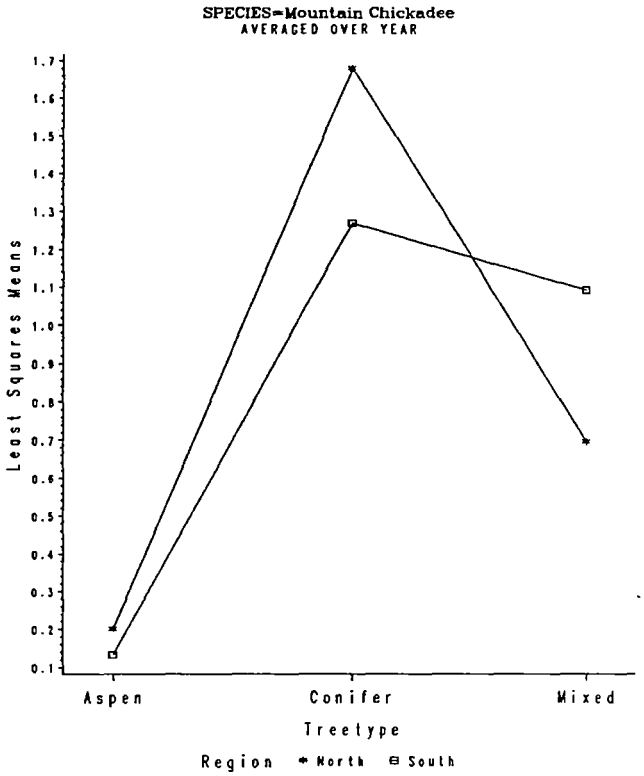
Fig. 23. Least squares means for Mountain Chickadee in 6 habitats.

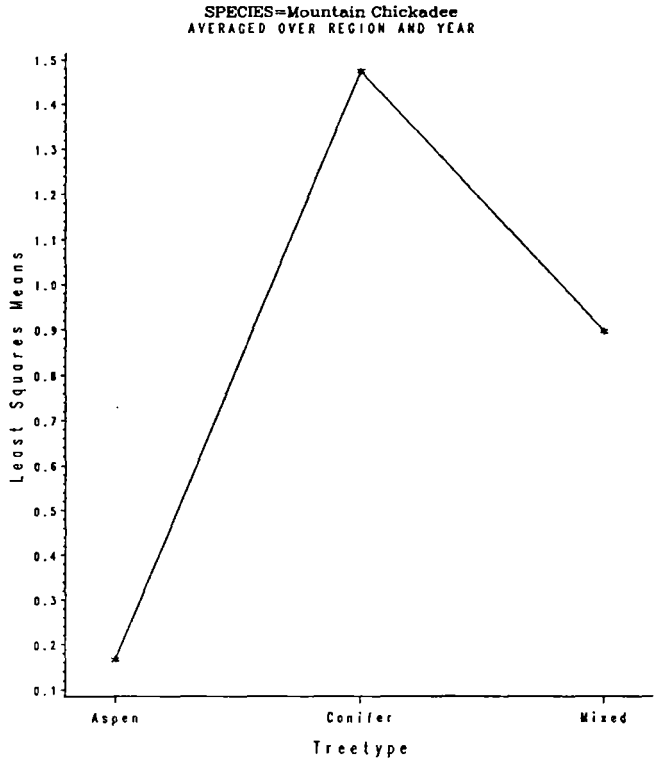









SPECIES=Mountain Chickadee
AVERAGED OVER YEAR
Least Squares Means
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Mountain Chickadee
AVERAGED OVER REGION AND YEAR
Least Squares Means
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
Aspen
Conifer
Mixed
Treetype

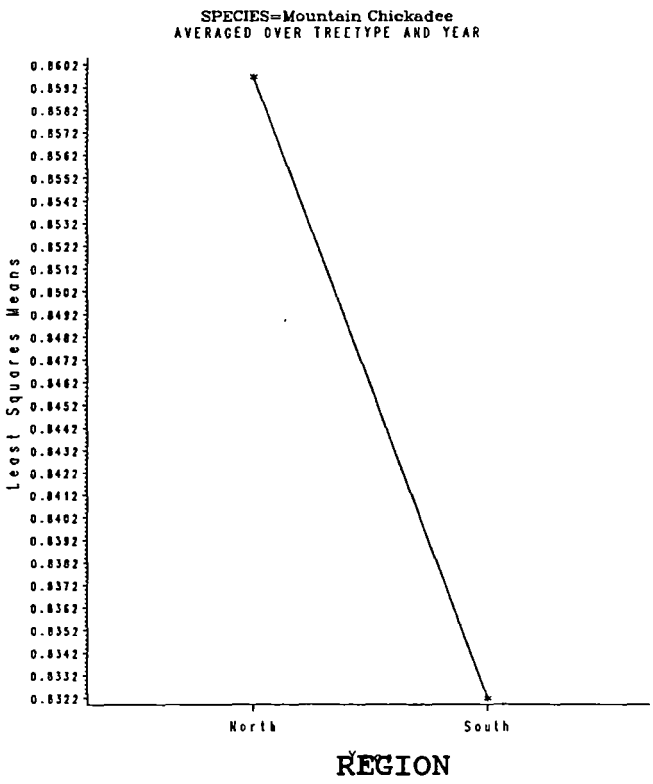

SPECIES=Mountain Chickadee
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
0.8602
0.8592
0.8582
0.8572
0.8562
0.8552
0.8542
0.8532
0.8522
0.8512
0.8502
0.8492
0.8482
0.8472
0.8462
0.8452
0.8442
0.8432
0.8422
0.8412
0.8402
0.8392
0.8382
0.8372
0.8362
0.8352
0.8342
0.8332
0.8322
North
South
REGION

Fig. 24. Least squares means for Northern Flicker in 6 habitats.

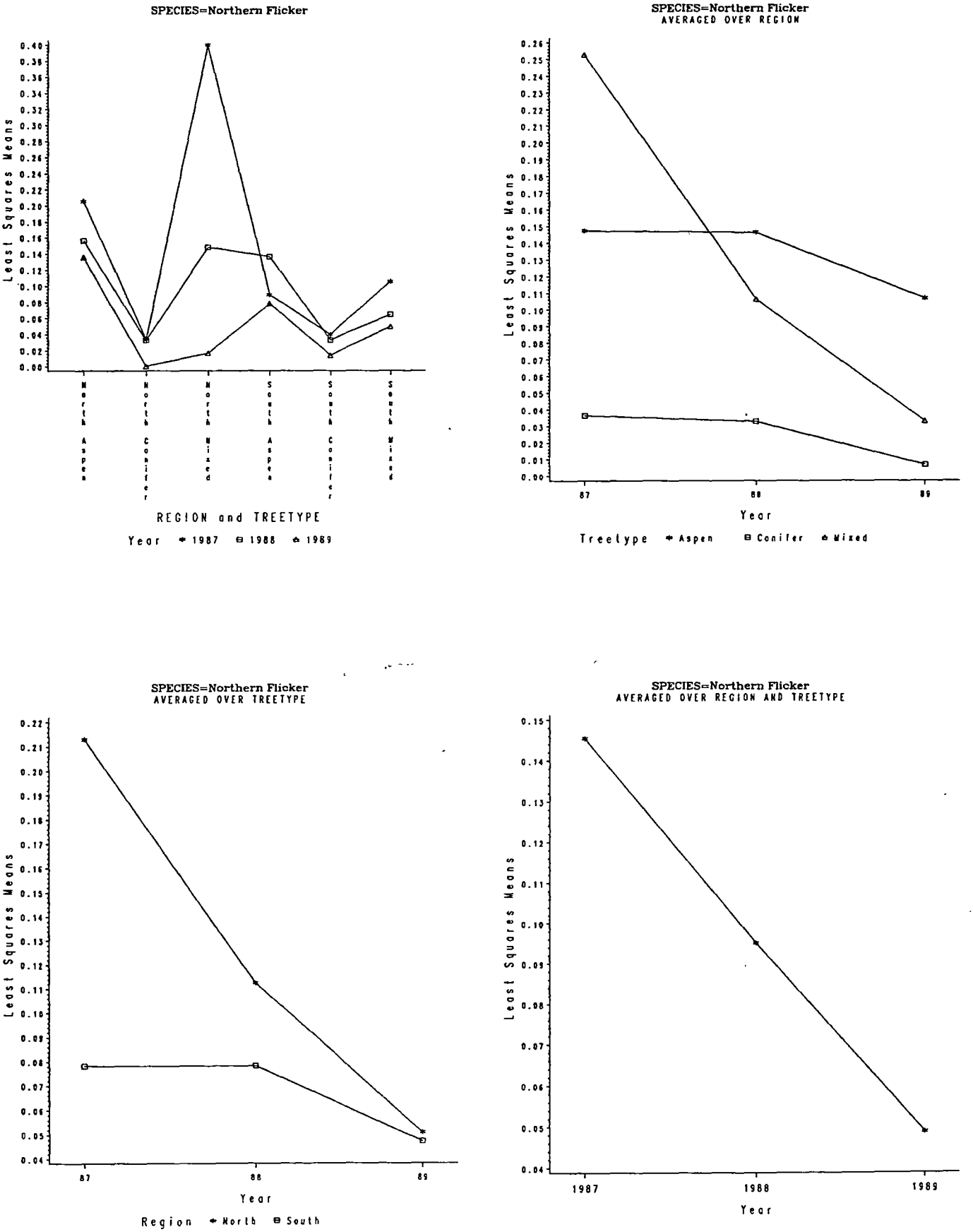
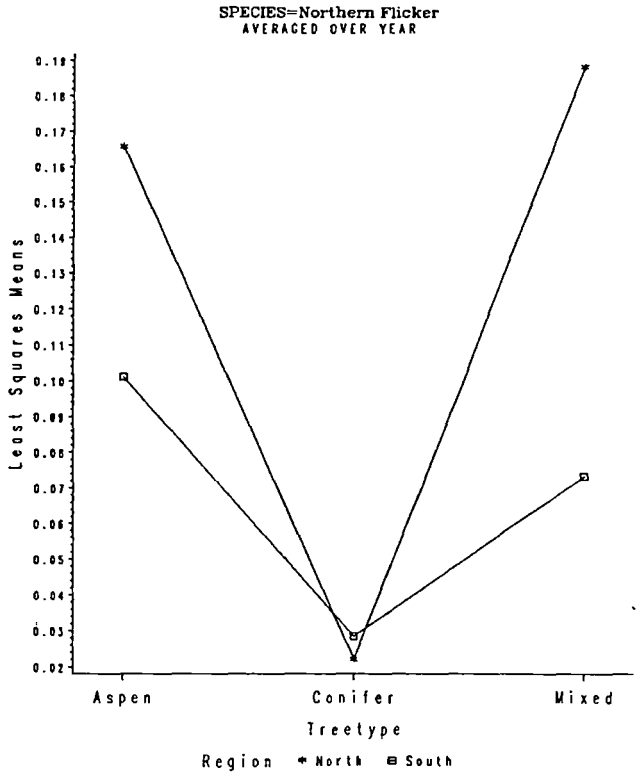
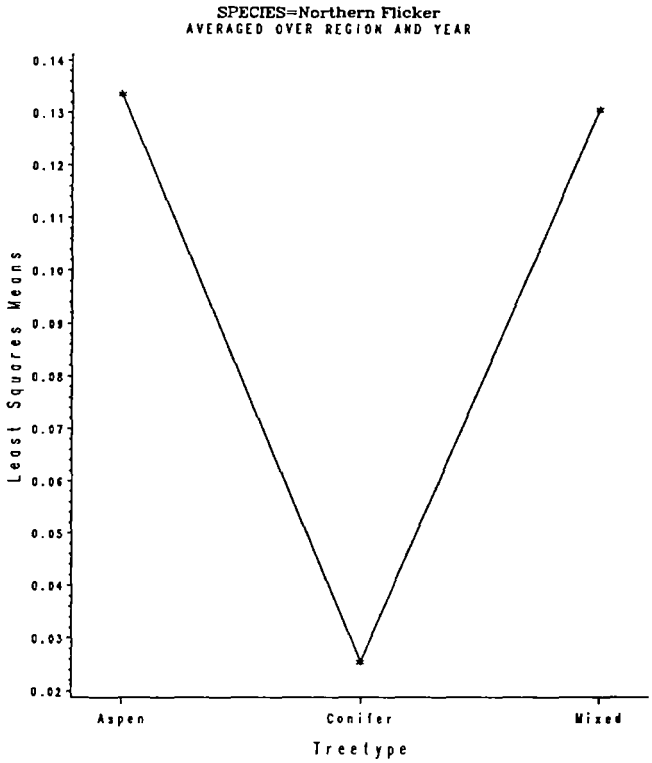


Fig. 24 (cont).


SPECIES=Northern Flicker
AVERAGED OVER YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Northern Flicker
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

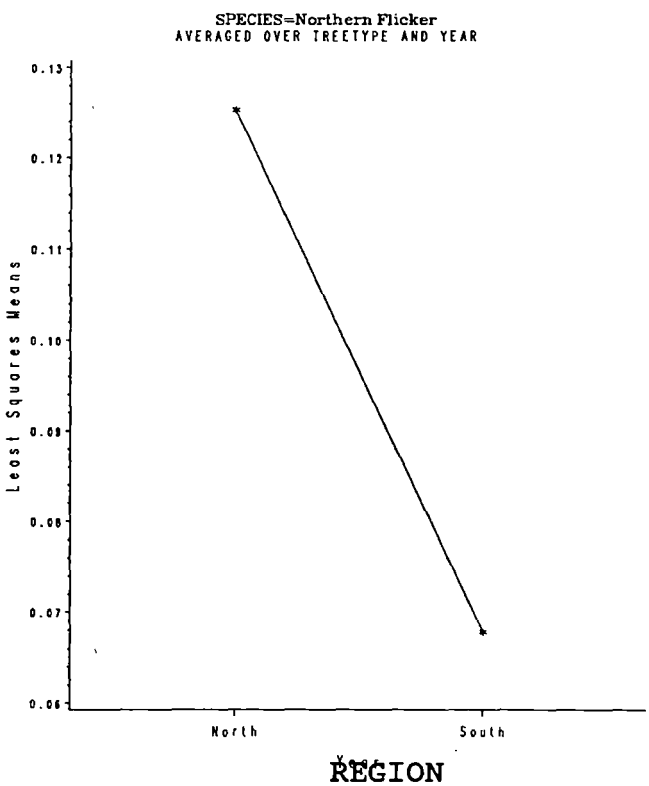
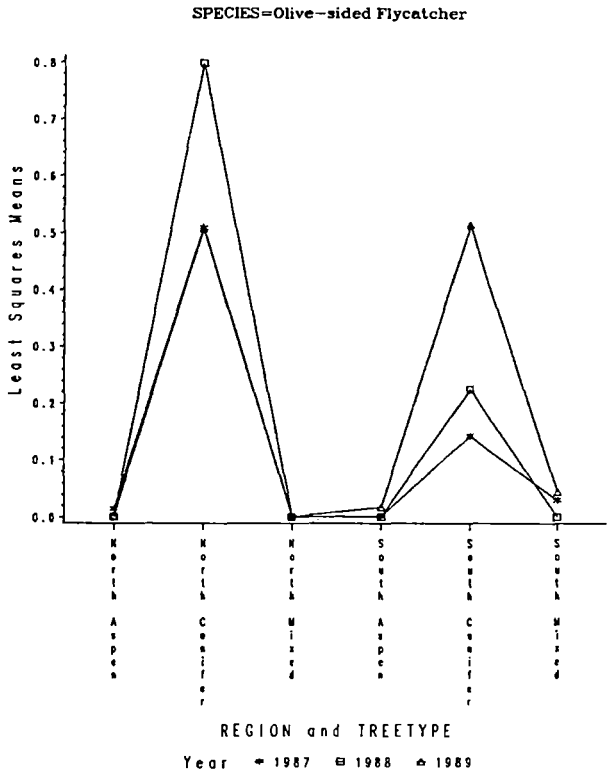
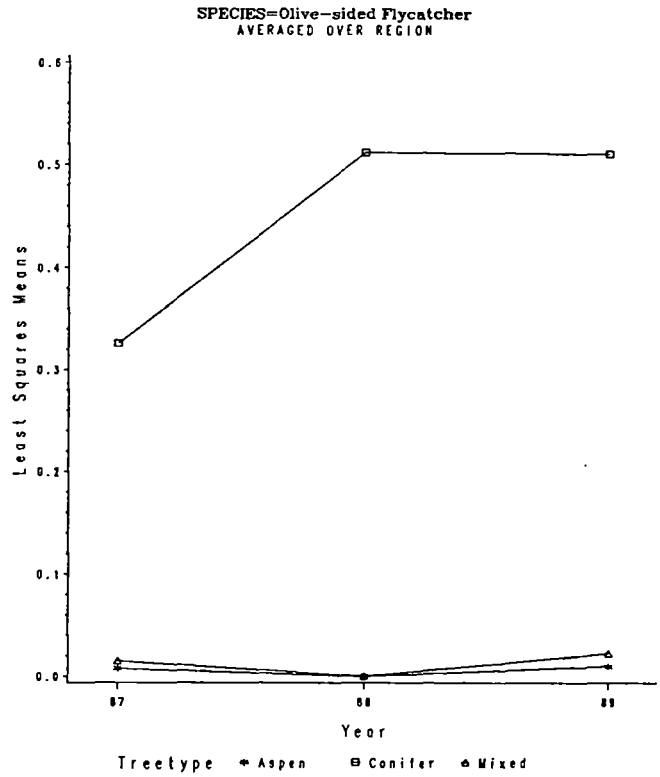
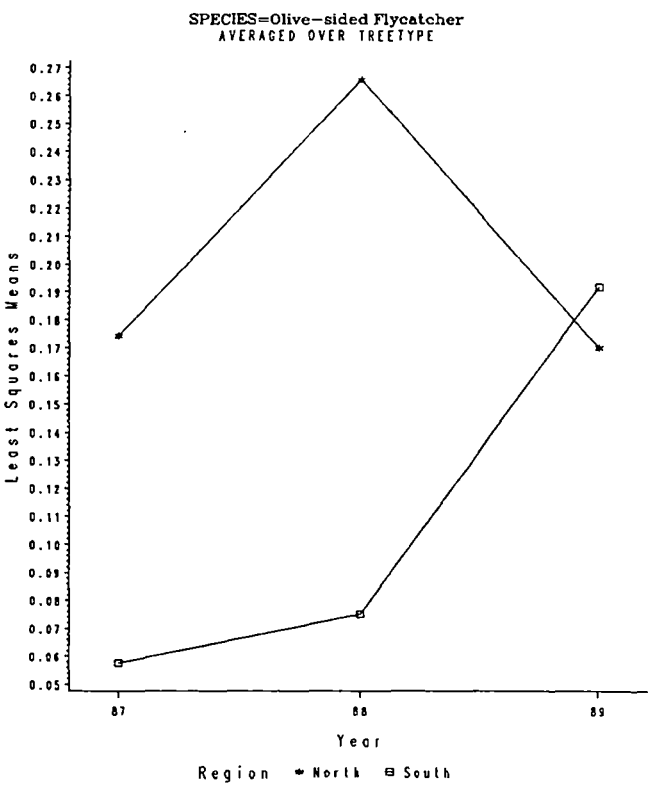

SPECIES=Northern Flicker
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

Fig. 25. Least squares means for Olive-sided Flycatcher in 6 habitats.







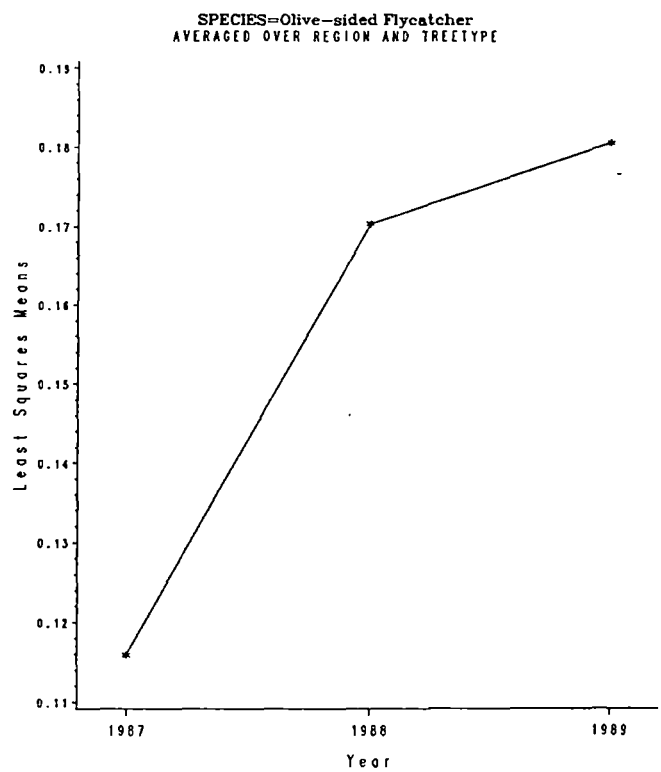
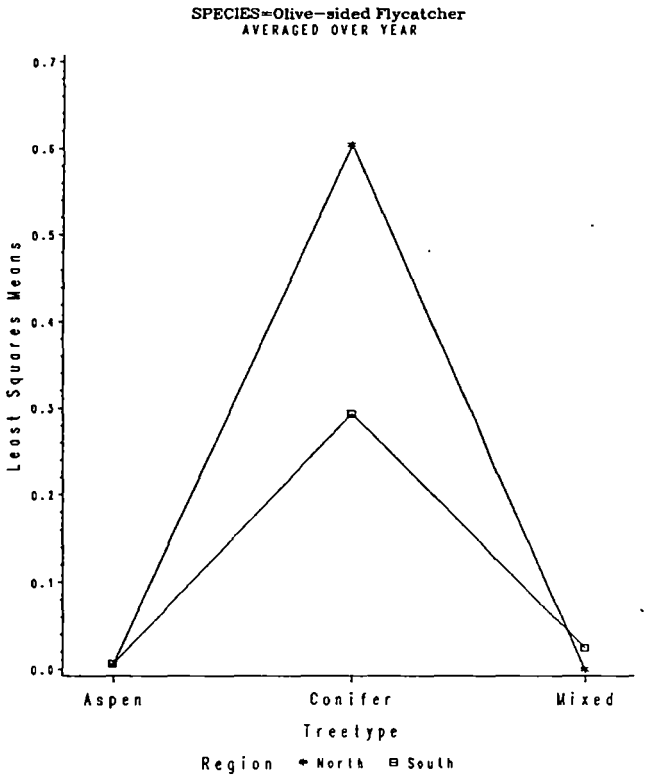
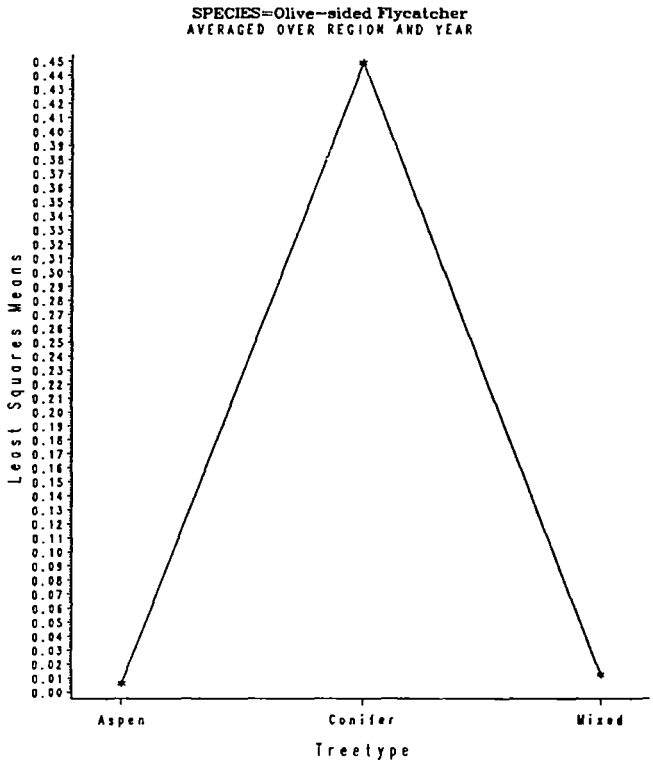


Fig. 25 (cont).


SPECIES=Olive-sided Flycatcher
AVERAGED OVER YEAR
Least Squares Means
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Olive-sided Flycatcher
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

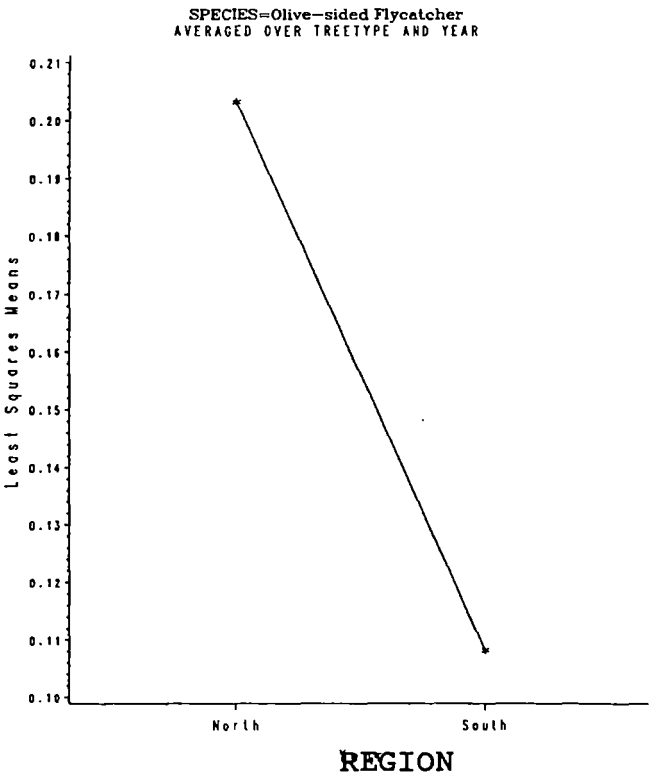
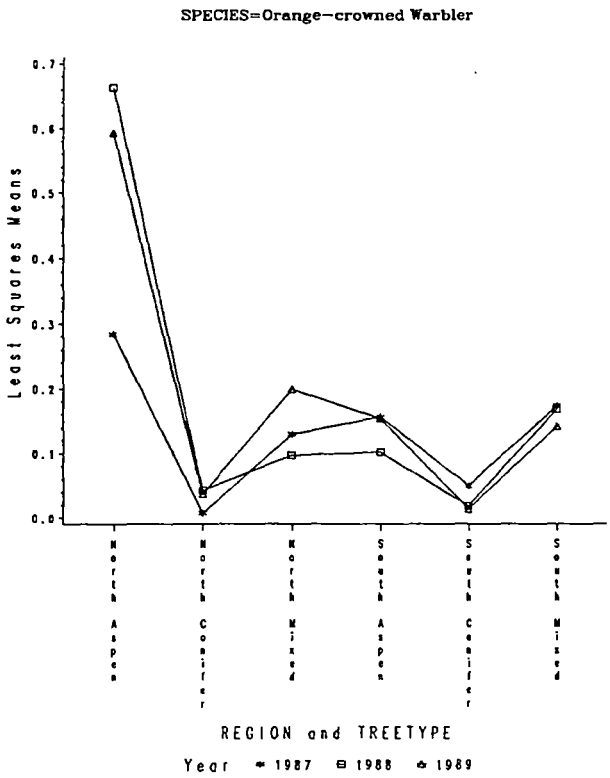
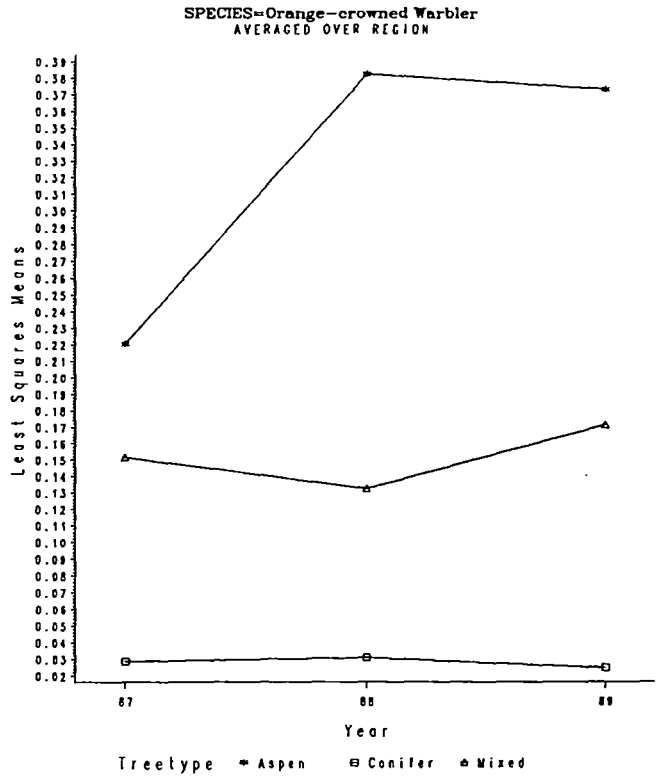
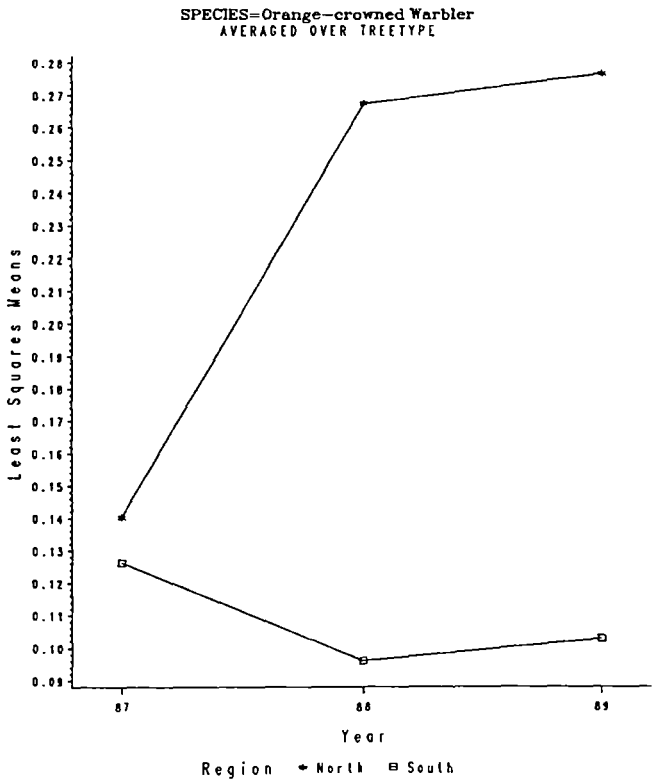
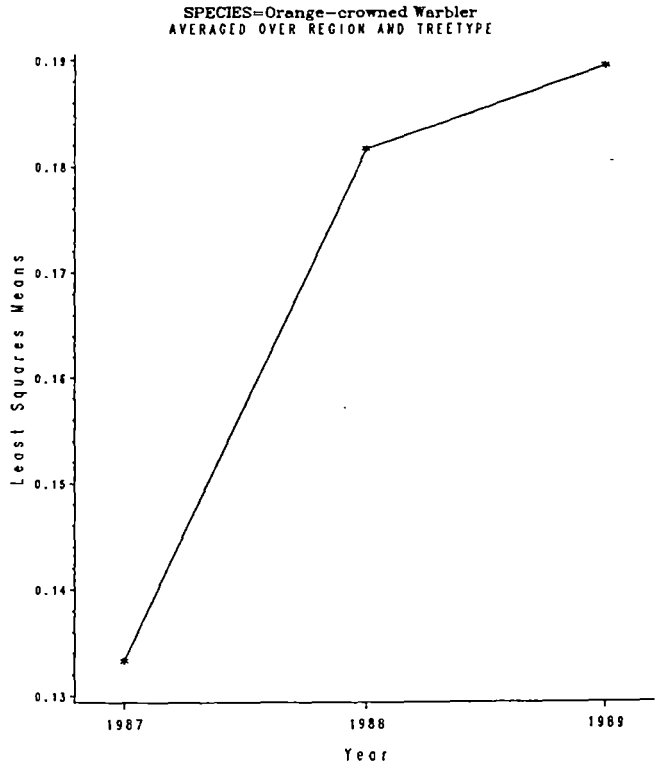

SPECIES=Olive-sided Flycatcher
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
0.21
0.20
0.19
0.18
0.17
0.16
0.15
0.14
0.13
0.12
0.11
0.10
North
South
REGION

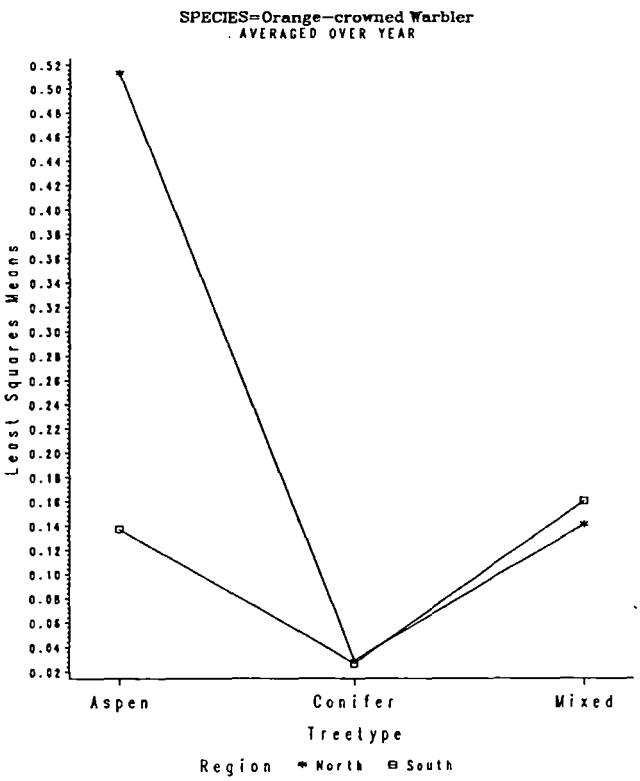
Fig. 26. Least squares means for Orange-crowned Warbler in 6 habitats.

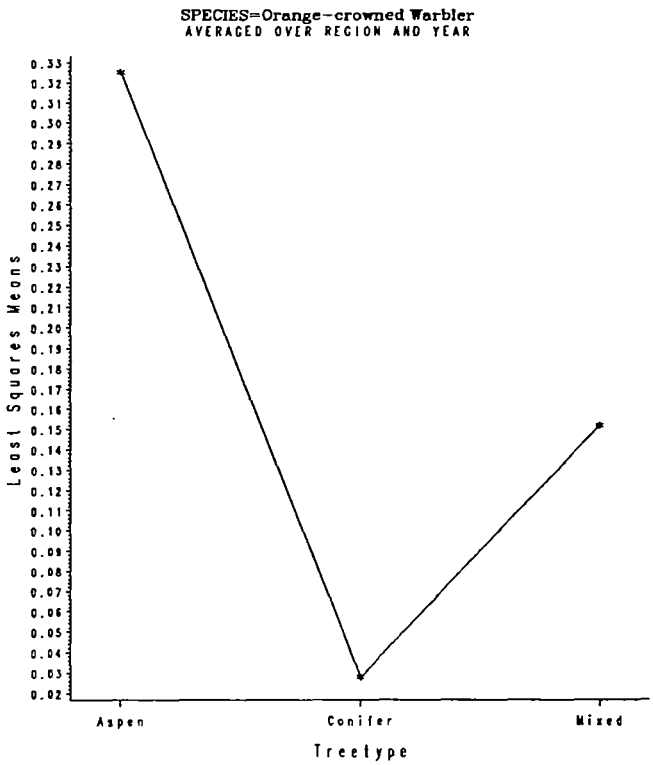









SPECIES=Orange-crowned Warbler
AVERAGED OVER YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Orange-crowned Warbler
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

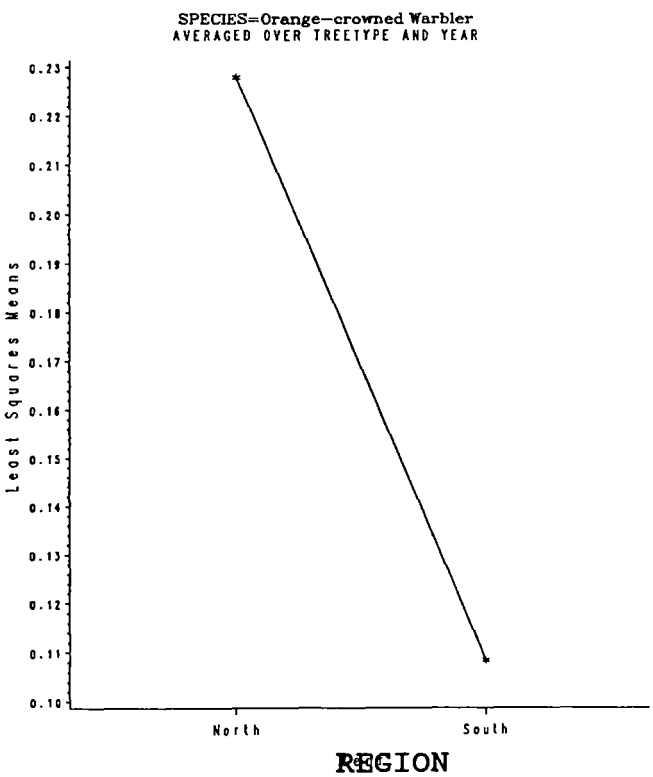

SPECIES=Orange-crowned Warbler
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

Fig. 27. Least squares means for Pine Grosbeak in 6 habitats.

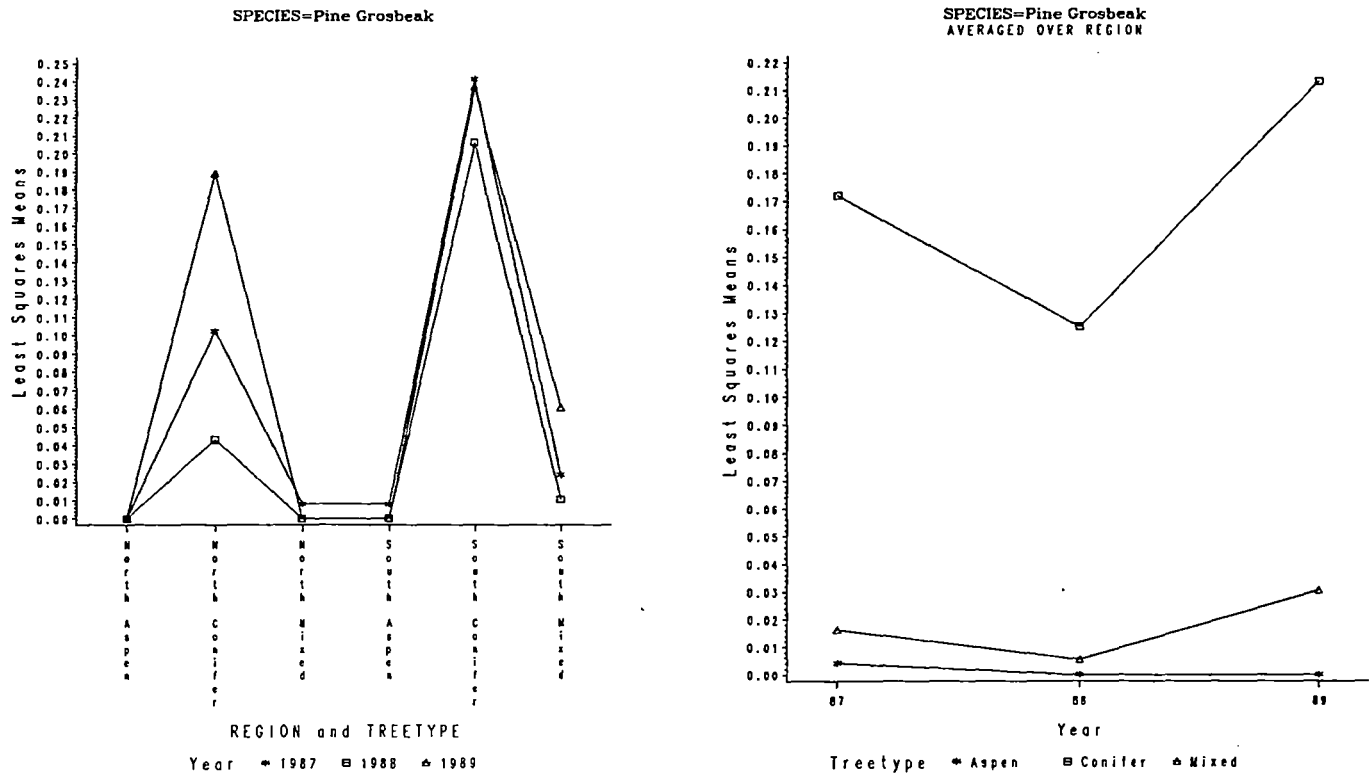
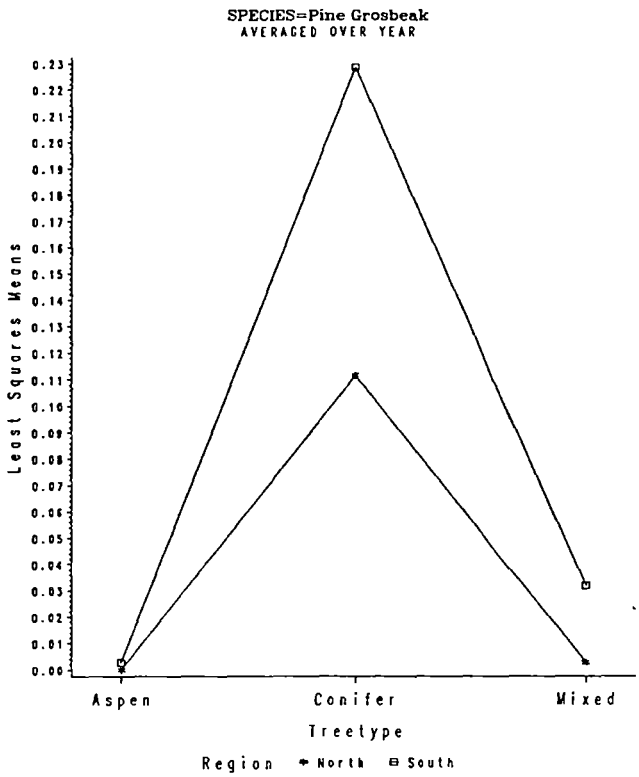
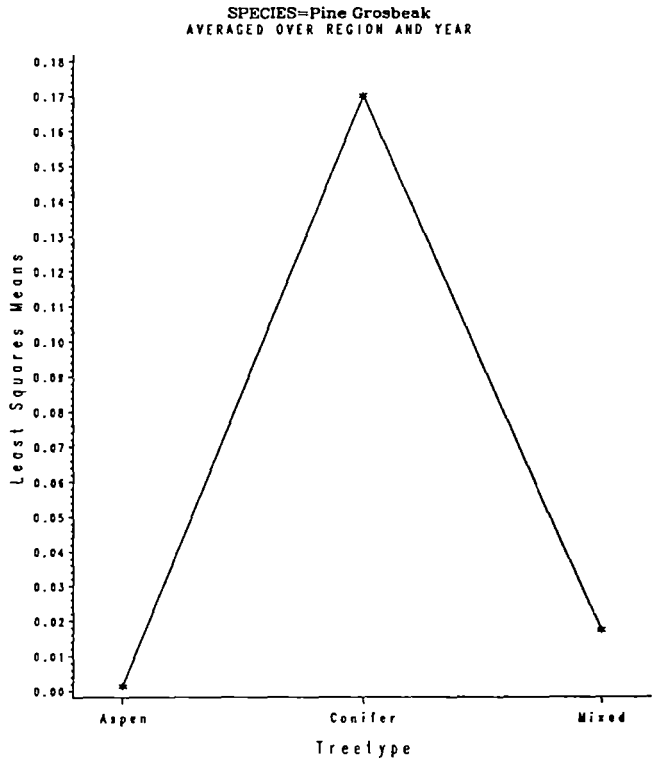


Fig. 27 (cont).


SPECIES=Pine Grosbeak
AVERAGED OVER YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype
Region * North ⊟ South


SPECIES=Pine Grosbeak
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

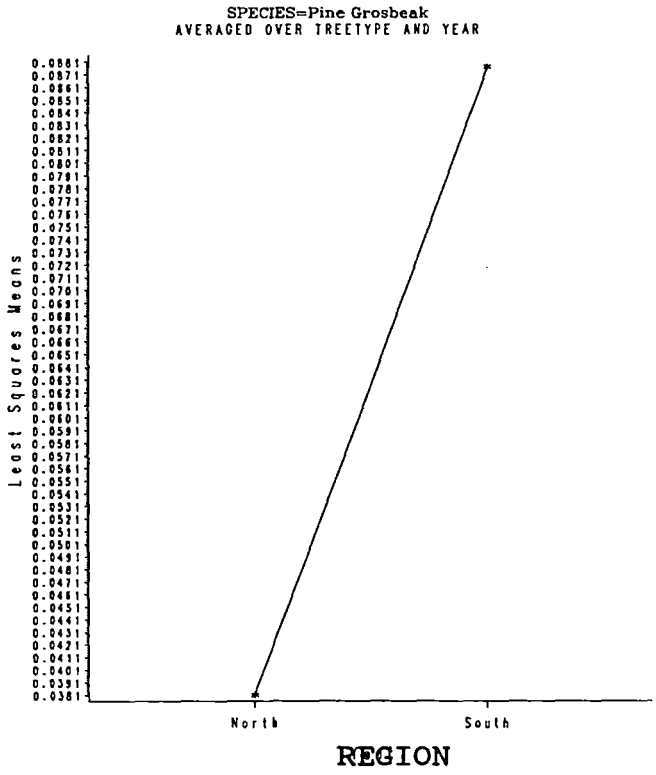
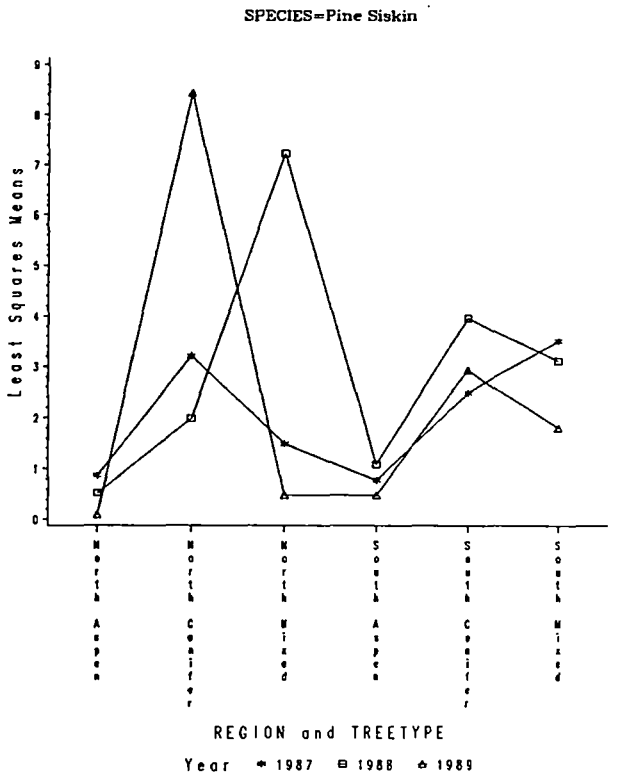
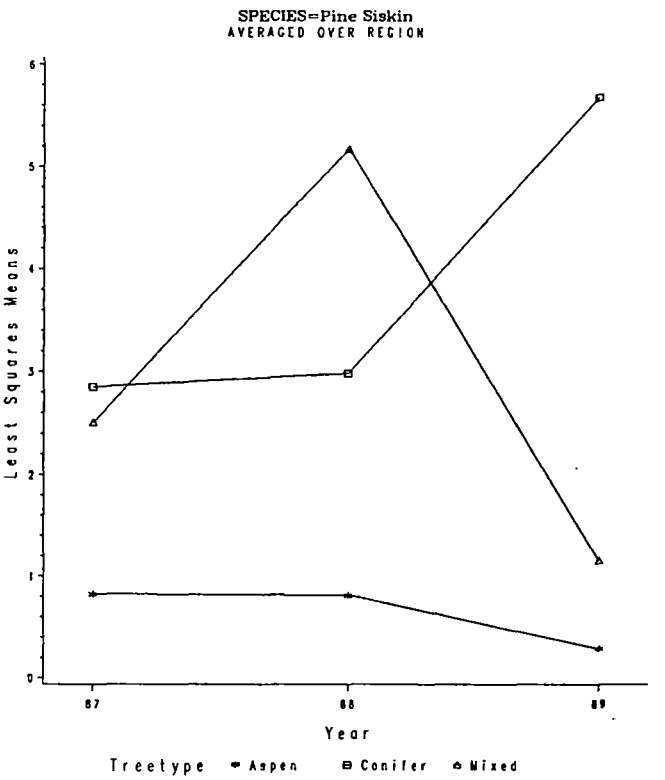
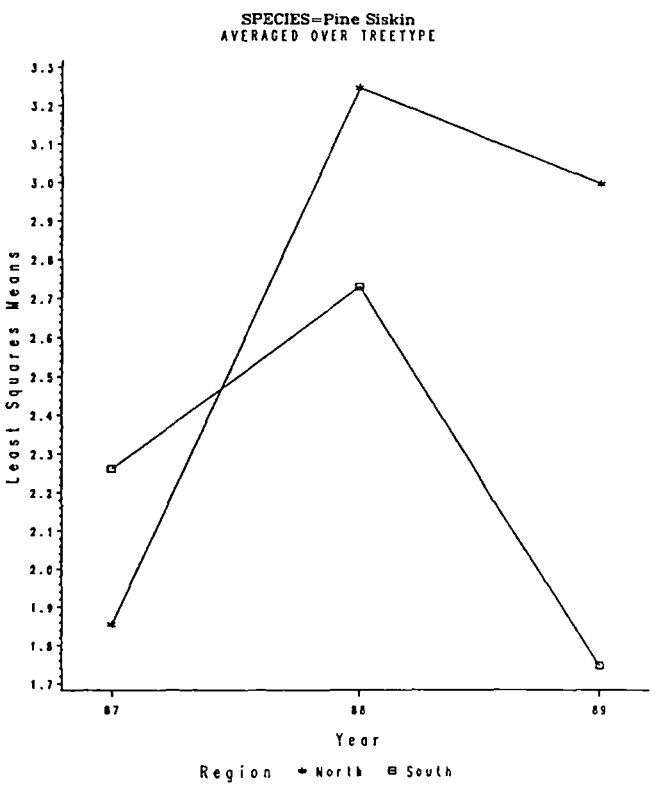

SPECIES=Pine Grosbeak
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

Fig. 28. Least squares means for Pine Siskin in 6 habitats.







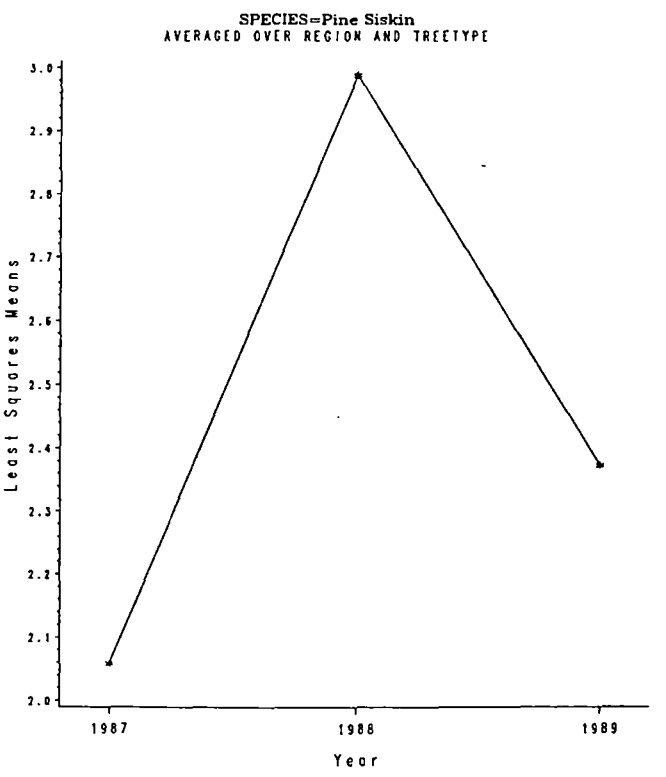
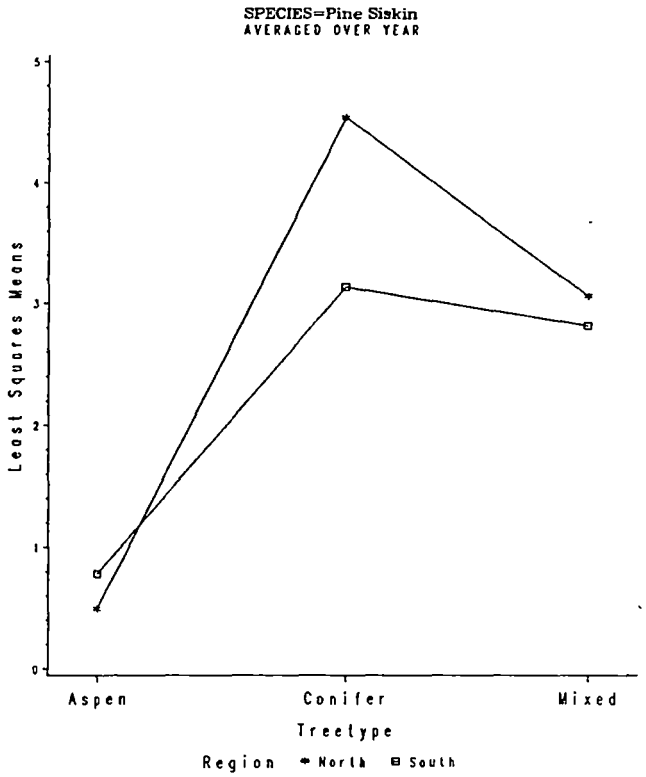
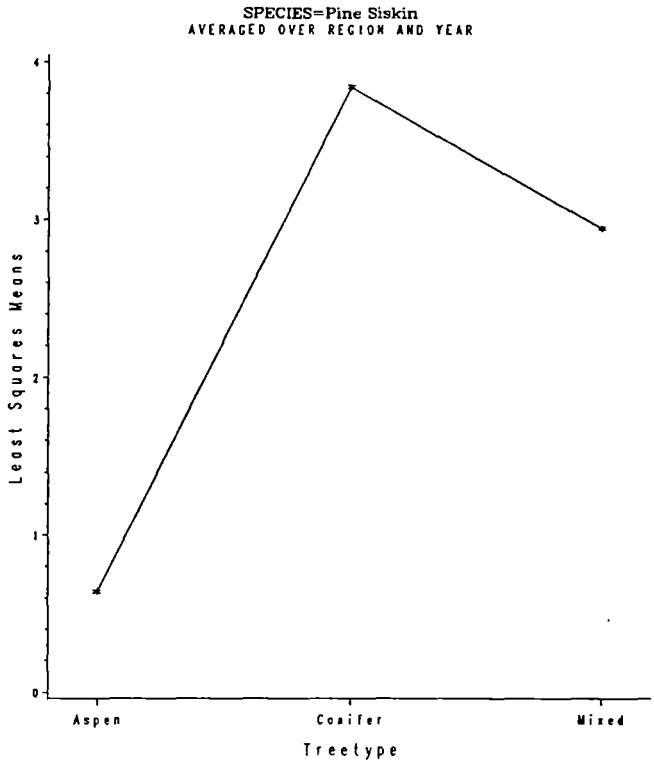


Fig. 28 (cont).


SPECIES=Pine Siskin
AVERAGED OVER YEAR
Least Squares Means
0
1
2
3
4
5
Aspen
Conifer
Mixed
Treetype
Region * North ⊡ South


SPECIES=Pine Siskin
AVERAGED OVER REGION AND YEAR
Least Squares Means
0
1
2
3
4
Aspen
Conifer
Mixed
Treetype

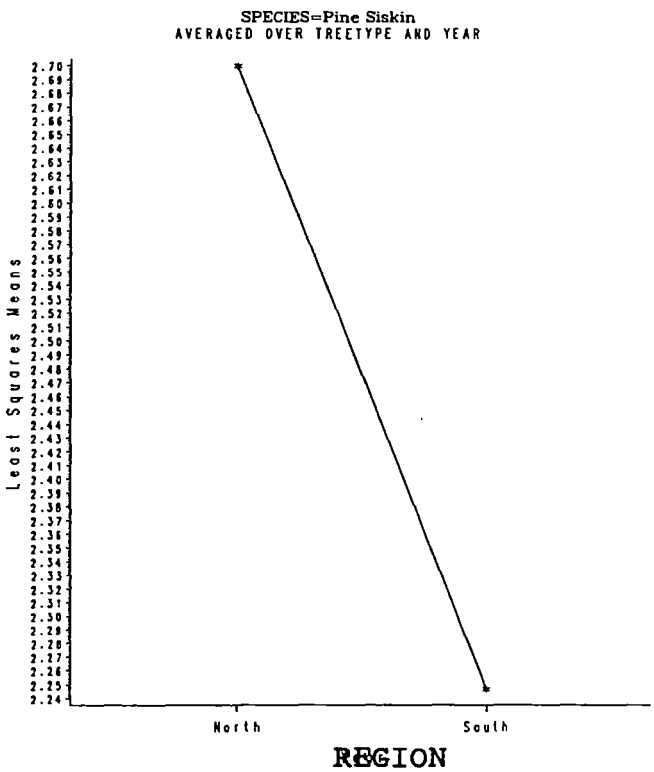

SPECIES=Pine Siskin
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

Fig. 29. Least squares means for Purple Martin in 6 habitats.

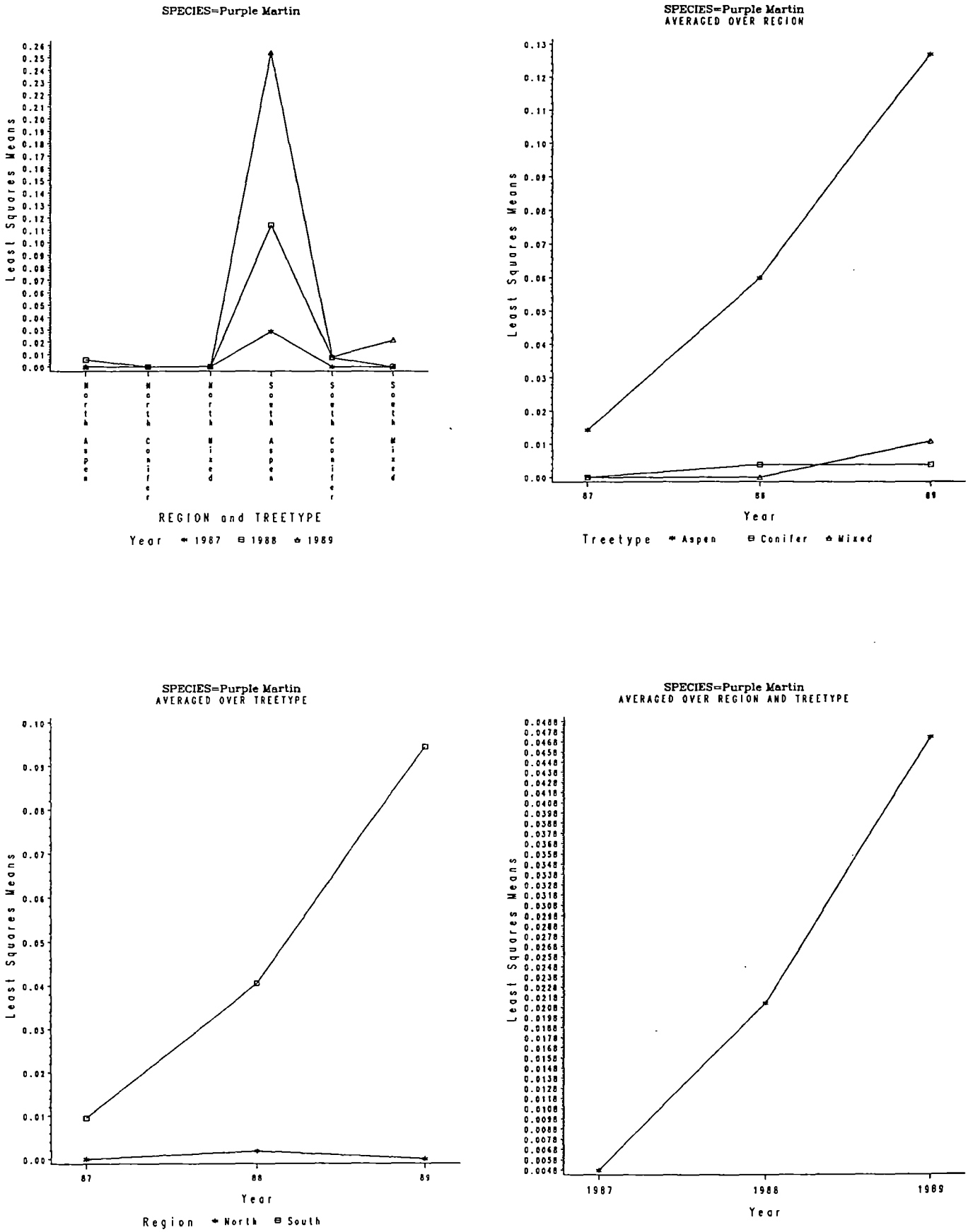
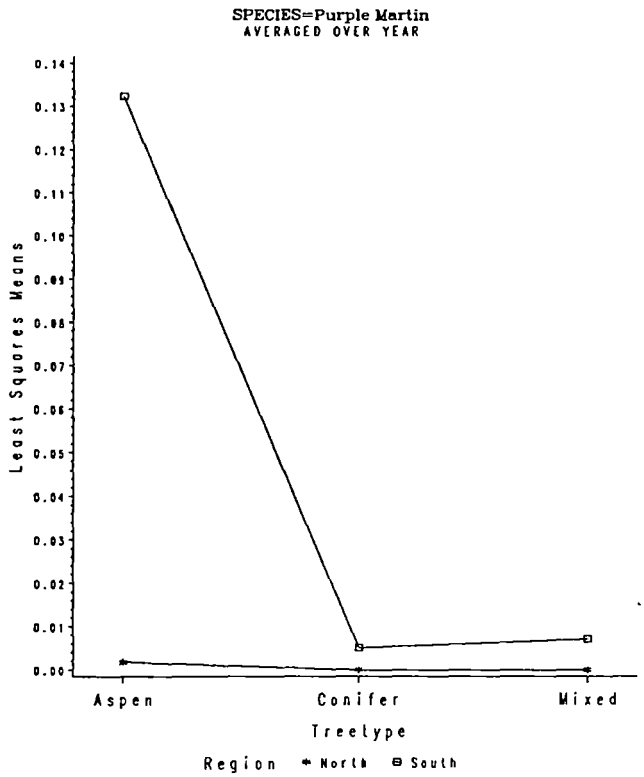
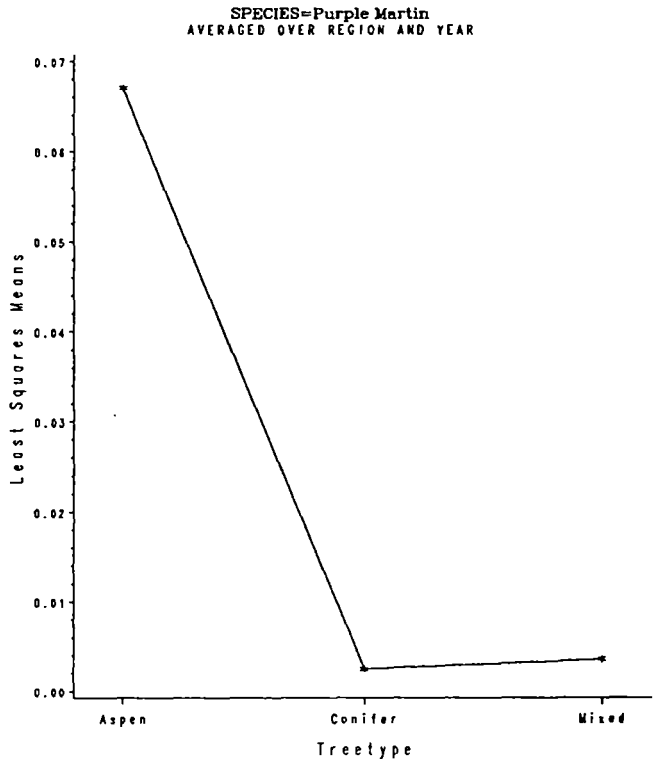


Fig. 29 (cont).


SPECIES=Purple Martin
AVERAGED OVER YEAR
Least Squares Means
0.14
0.13
0.12
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Purple Martin
AVERAGED OVER REGION AND YEAR
Least Squares Means
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Aspen
Conifer
Mixed
Treetype

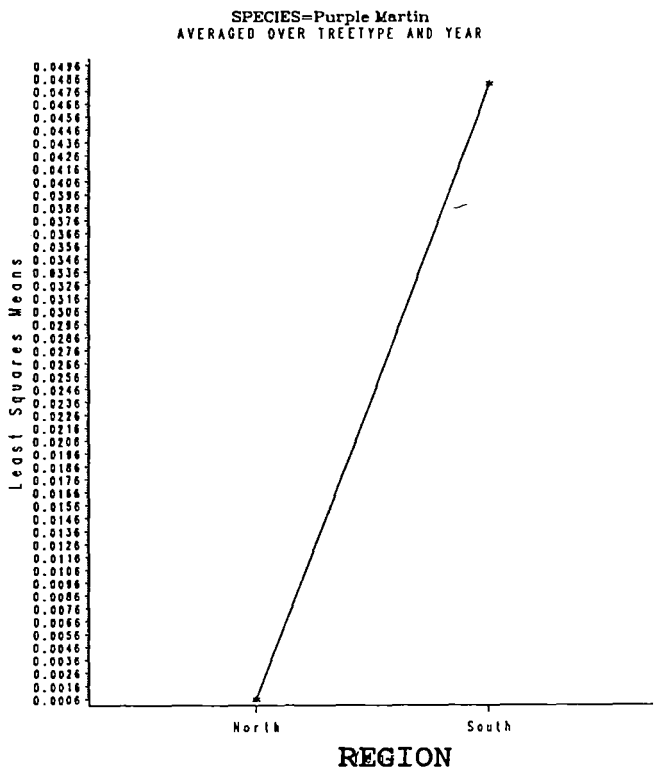
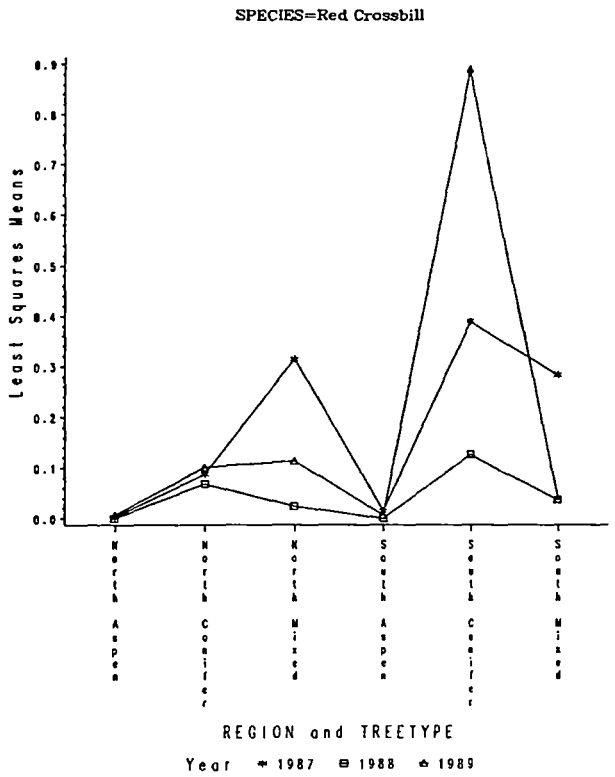
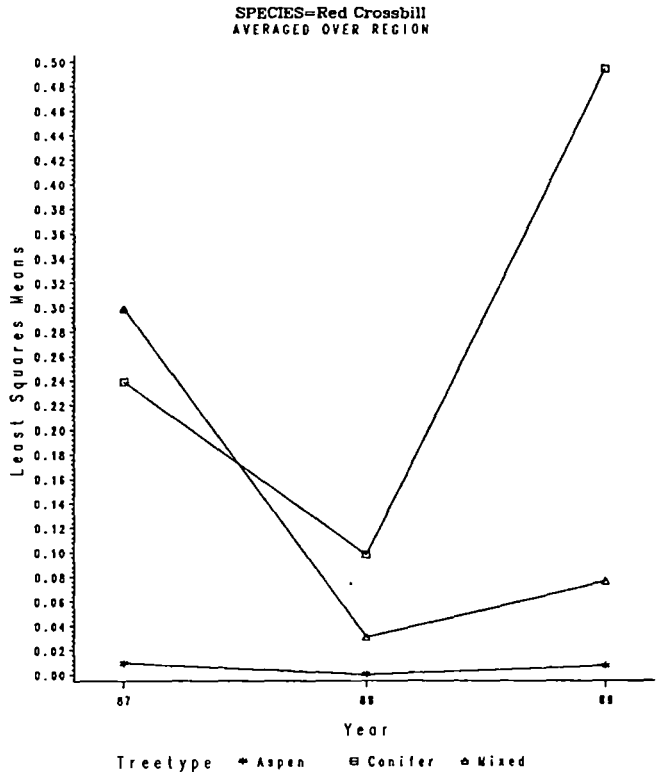
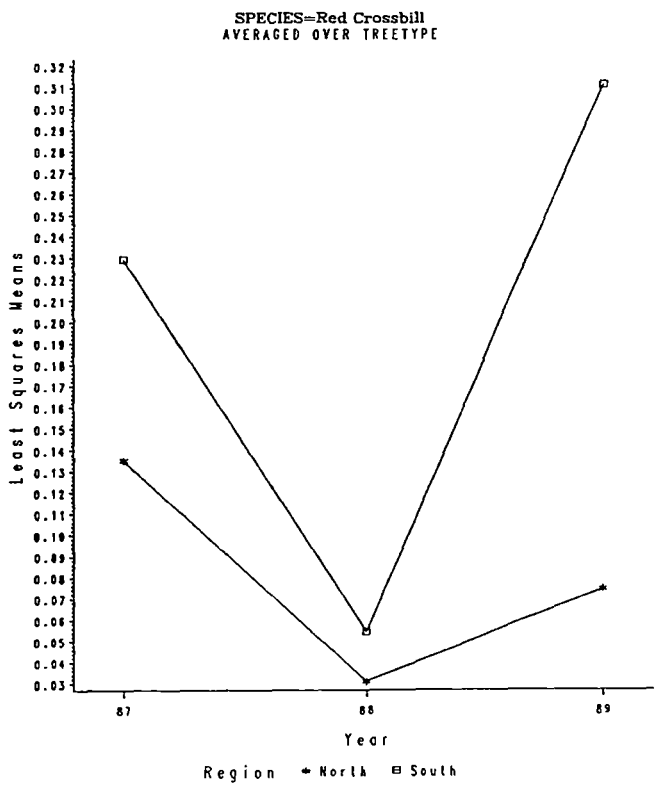

SPECIES=Purple Martin
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

Fig. 30. Least squares means for Red Crossbill in 6 habitats.







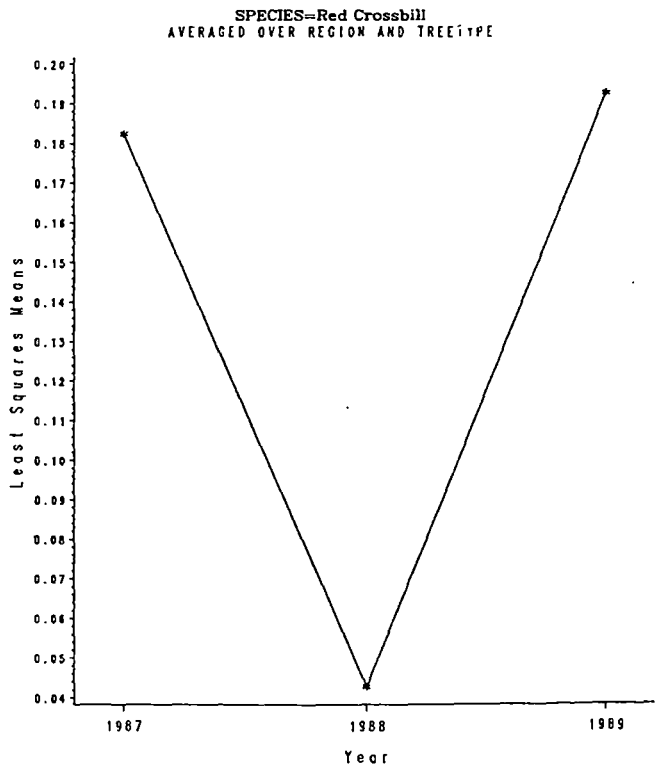
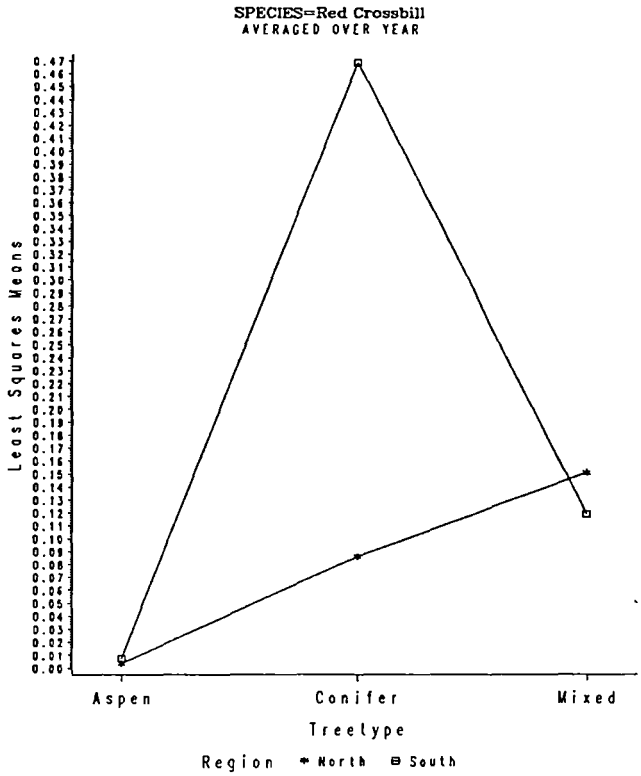
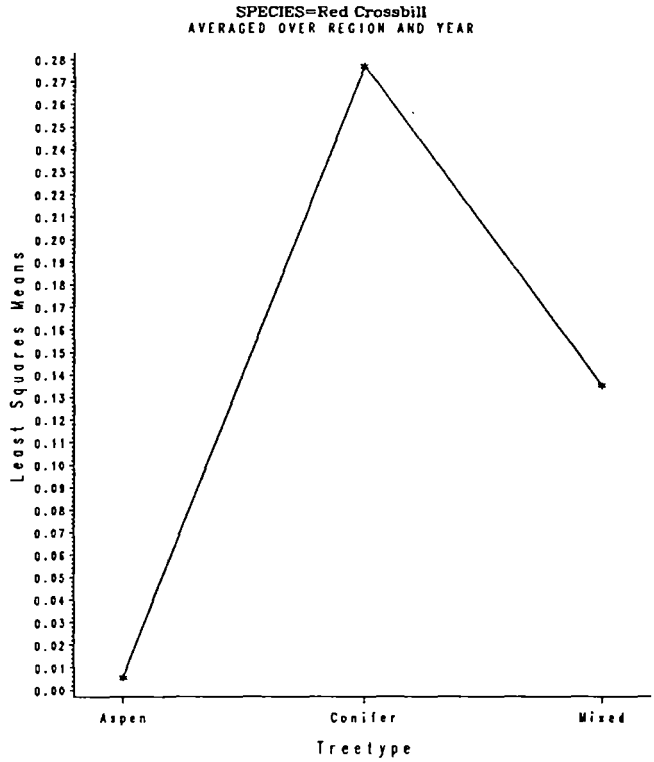


Fig. 30 (cont).


SPECIES=Red Crossbill
AVERAGED OVER YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Red Crossbill
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

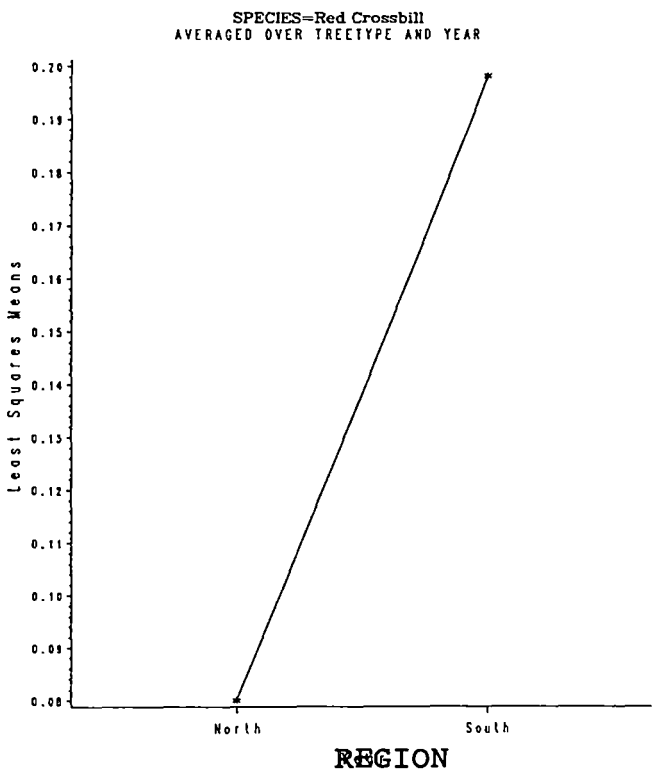
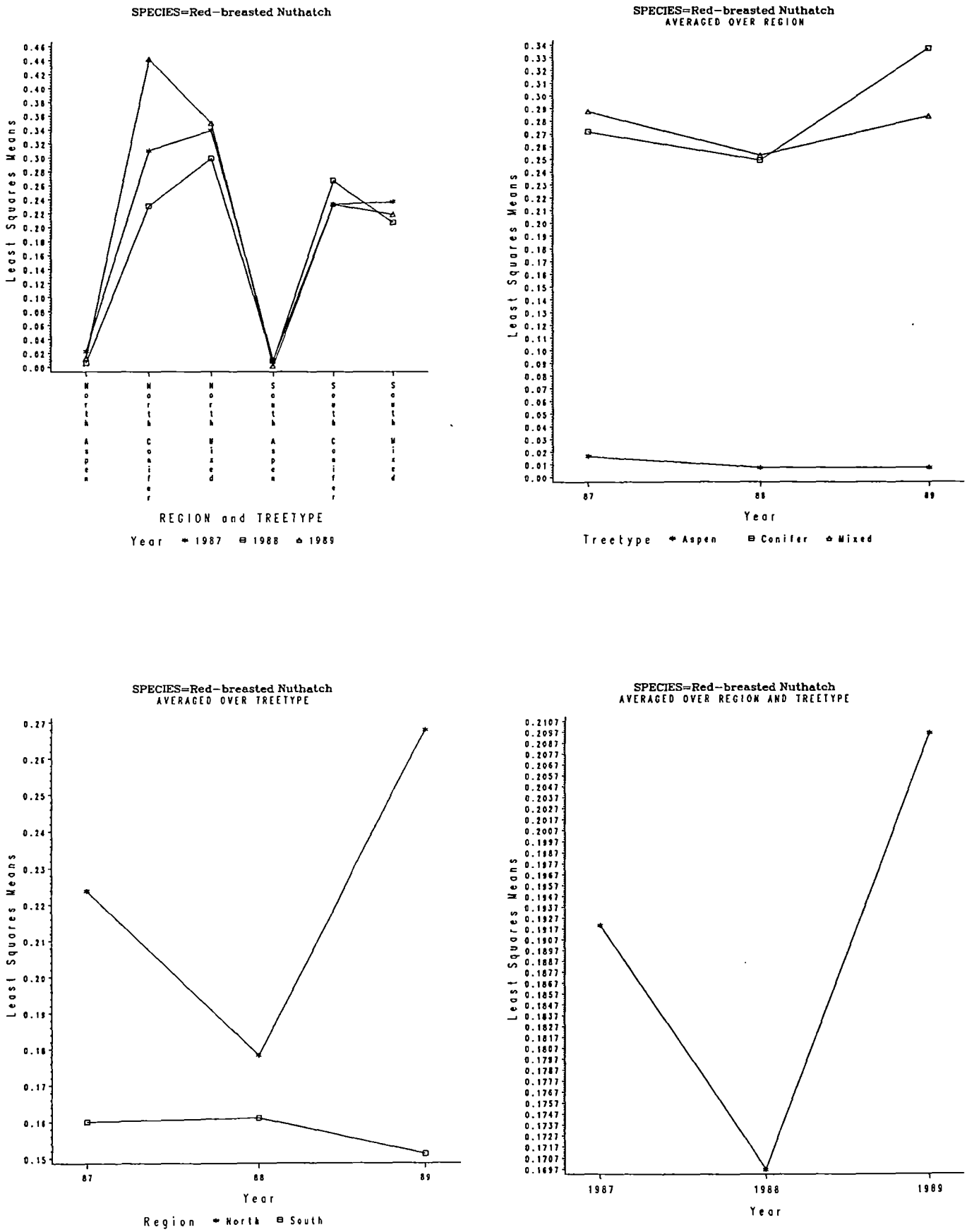
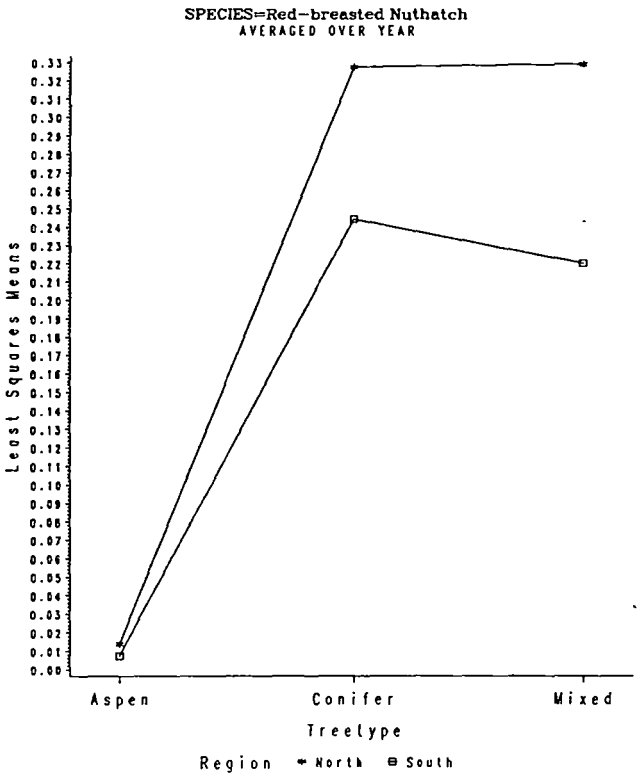
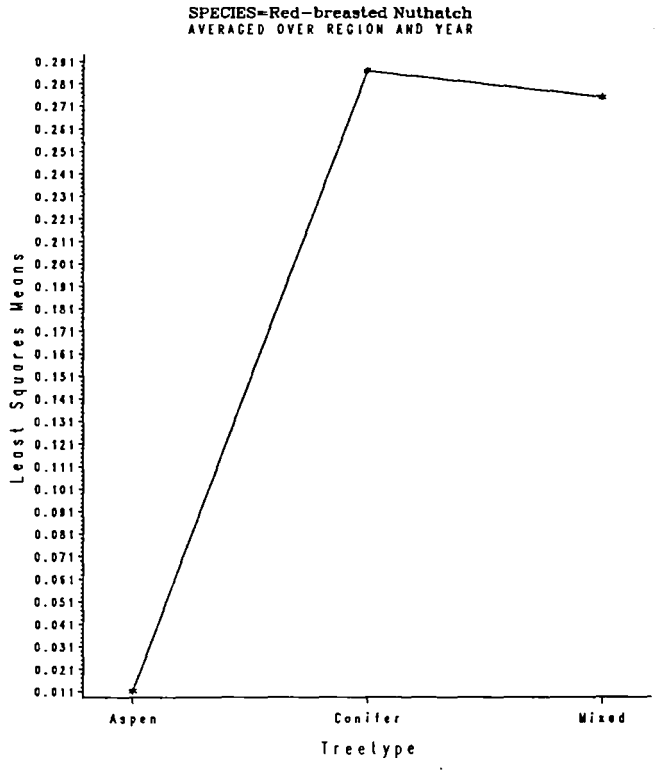

SPECIES=Red Crossbill
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

Fig. 31. Least squares means for Red-breasted Nuthatch in 6 habitats.




SPECIES=Red-breasted Nuthatch
AVERAGED OVER YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Red-breasted Nuthatch
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

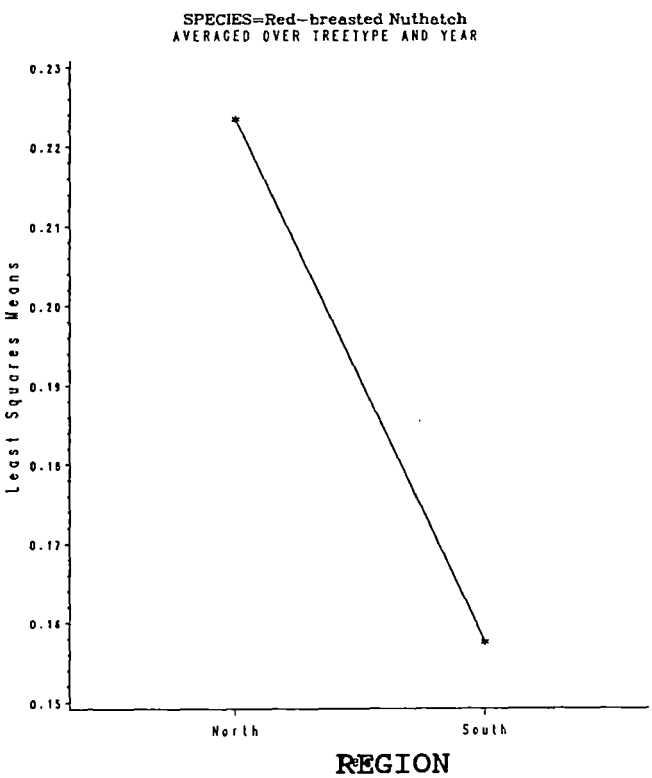

SPECIES=Red-breasted Nuthatch
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

Fig. 32. Least squares means for Red-naped Sapsucker in 6 habitats.

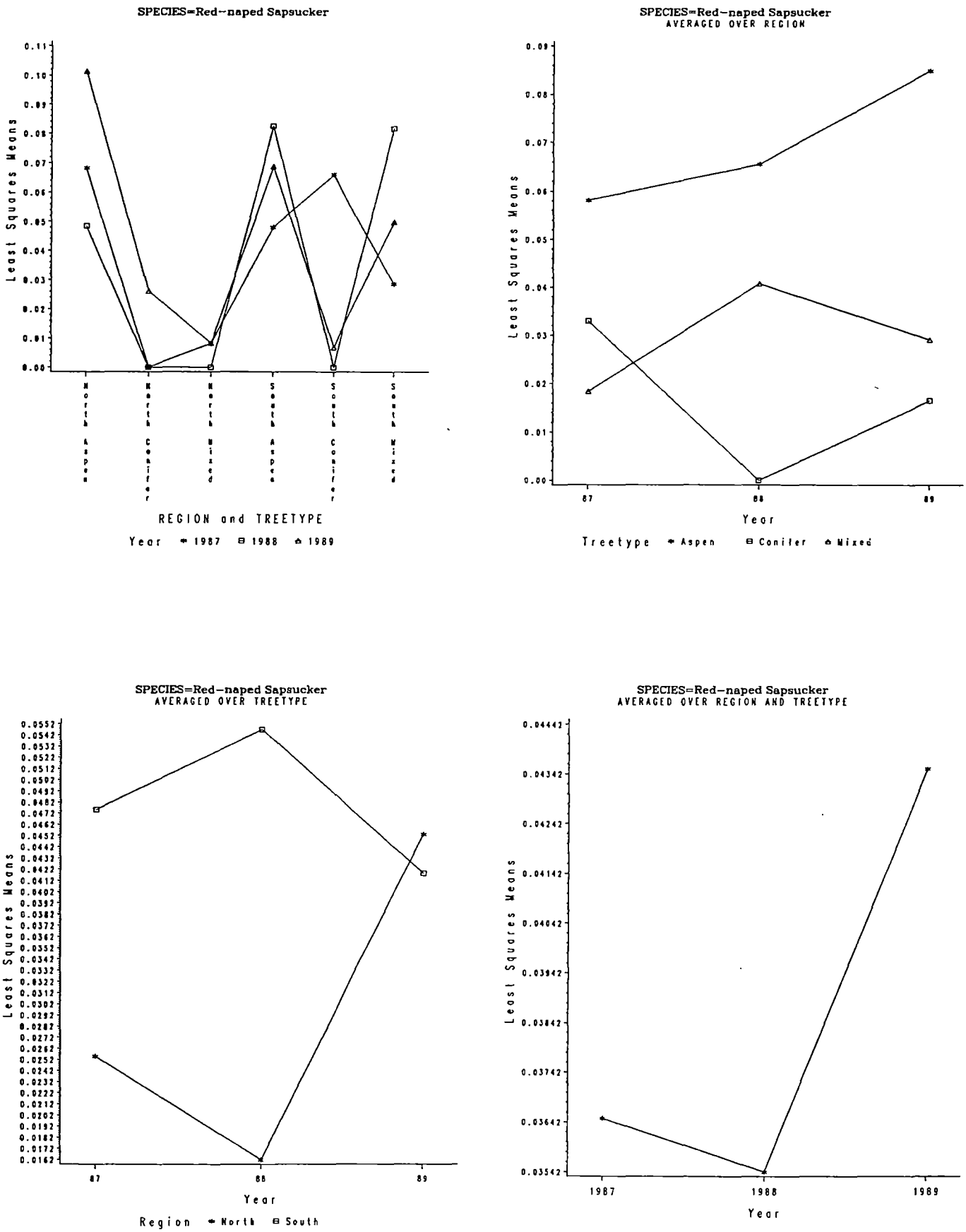
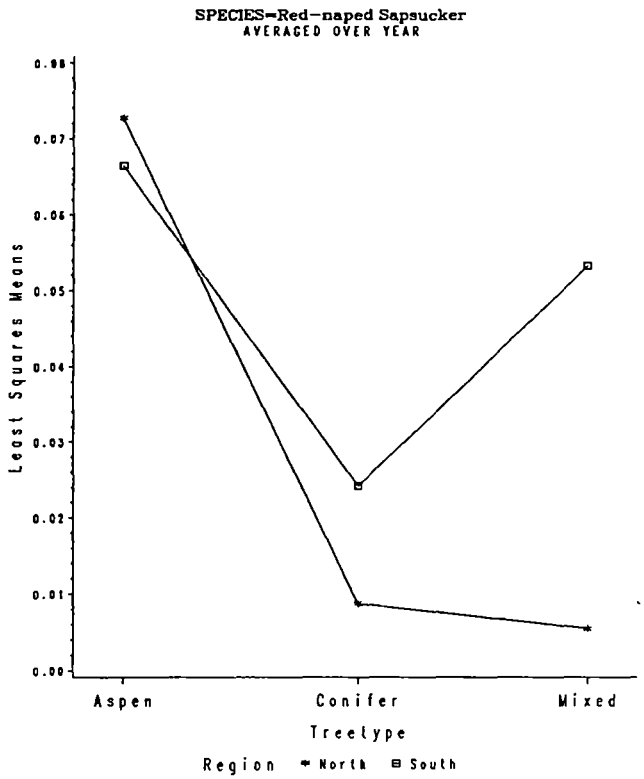
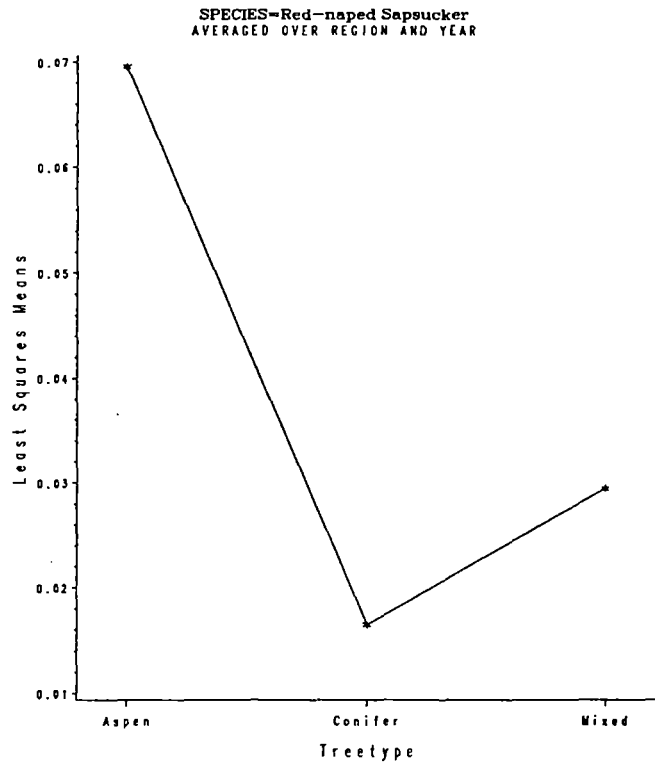


Fig. 32 (cont).


SPECIES=Red-naped Sapsucker
AVERAGED OVER YEAR
Least Squares Means
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
Aspen
Conifer
Mixed
Treetype
Region * North ⊟ South


SPECIES=Red-naped Sapsucker
AVERAGED OVER REGION AND YEAR
Least Squares Means
0.01
0.02
0.03
0.04
0.05
0.06
0.07
Aspen
Conifer
Mixed
Treetype

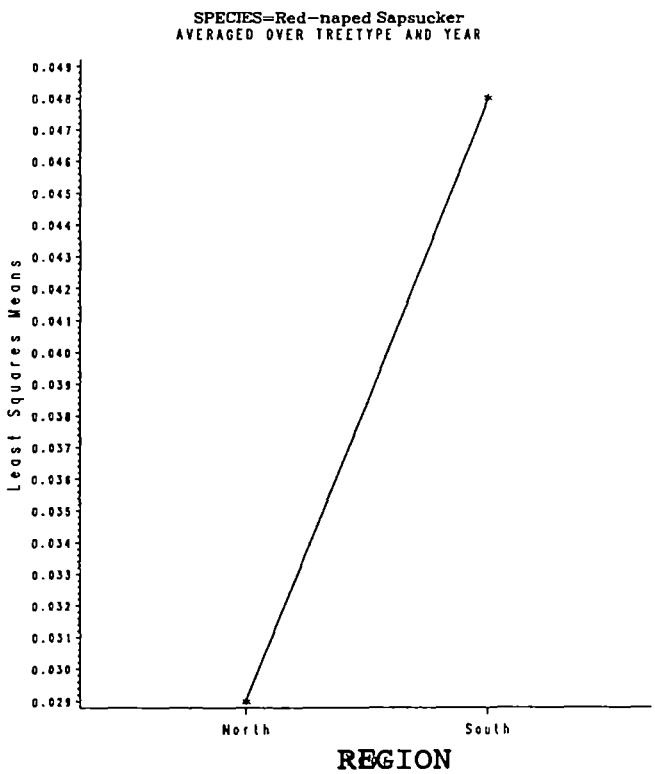
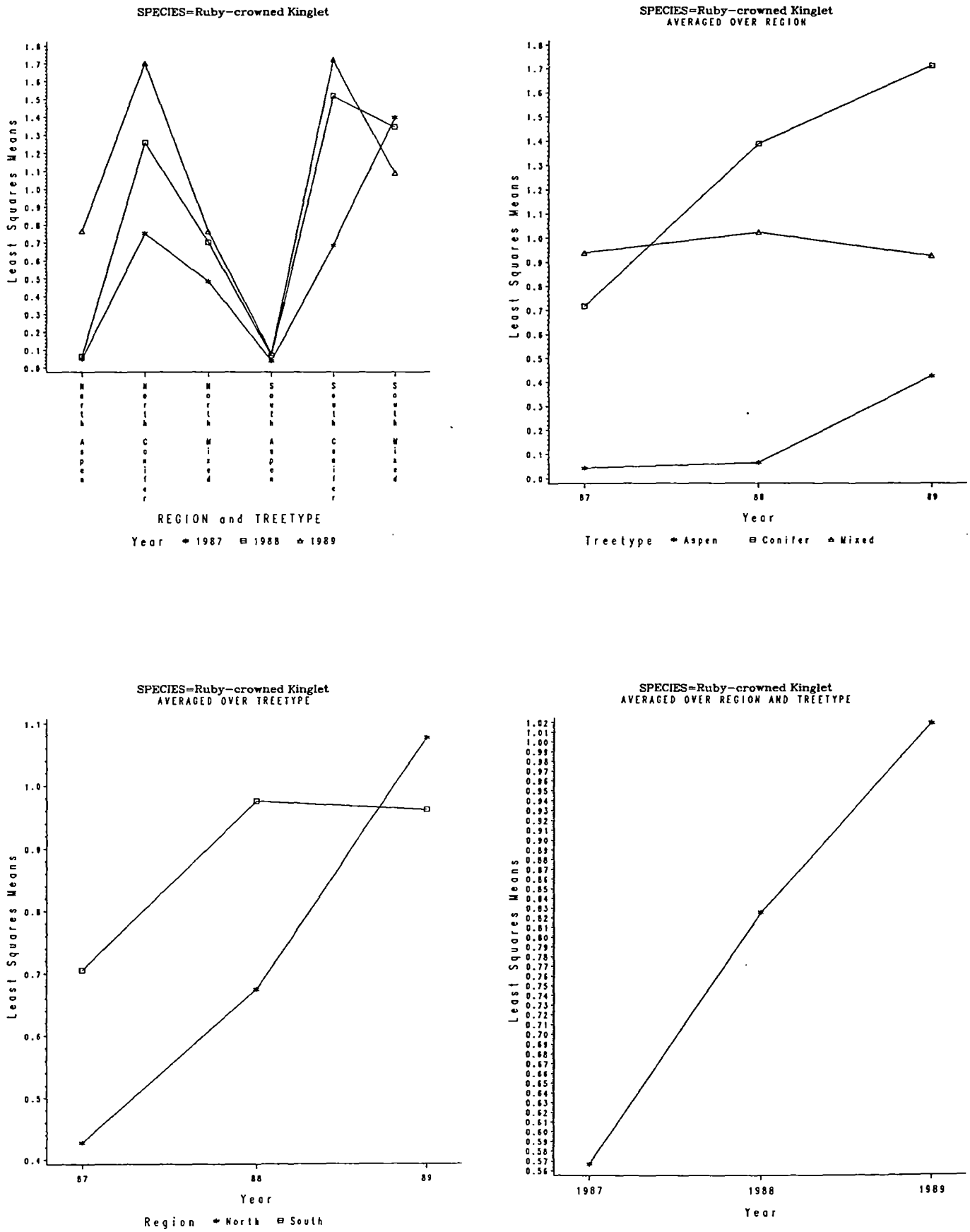
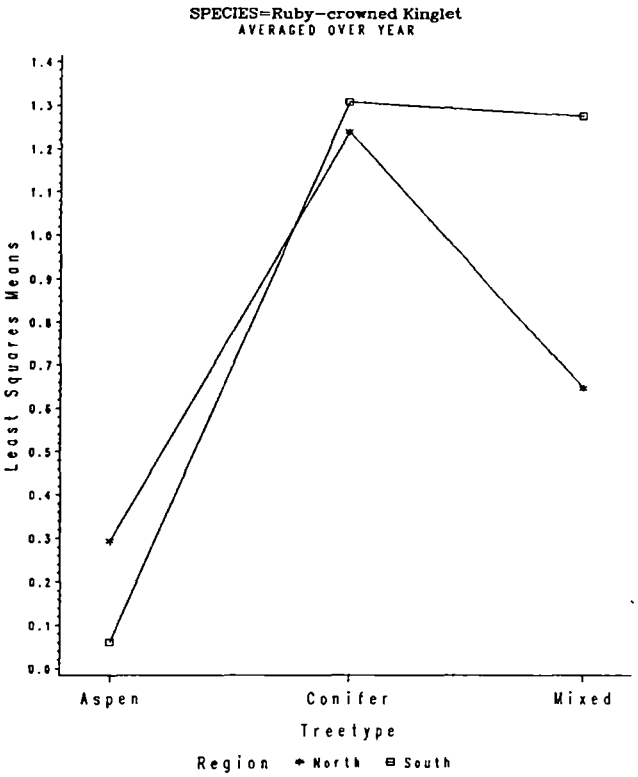
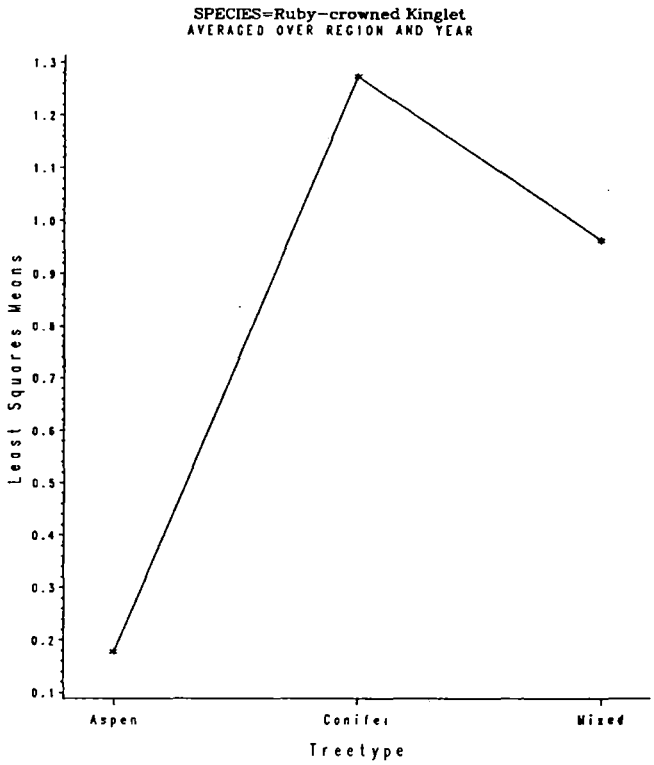

SPECIES=Red-naped Sapsucker
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
0.029
0.030
0.031
0.032
0.033
0.034
0.035
0.036
0.037
0.038
0.039
0.040
0.041
0.042
0.043
0.044
0.045
0.046
0.047
0.048
0.049
North
South
REGION

Fig. 33. Least squares means for Ruby-crowned Kinglet in 6 habitats.




SPECIES=Ruby-crowned Kinglet
AVERAGED OVER YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Ruby-crowned Kinglet
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

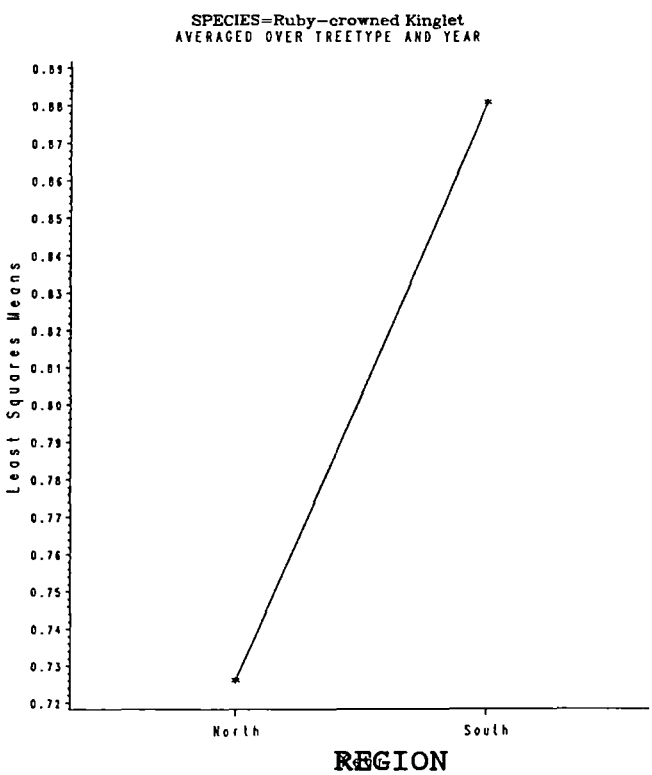

SPECIES=Ruby-crowned Kinglet
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

Fig. 34. Least squares means for Steller's Jay in 6 habitats.

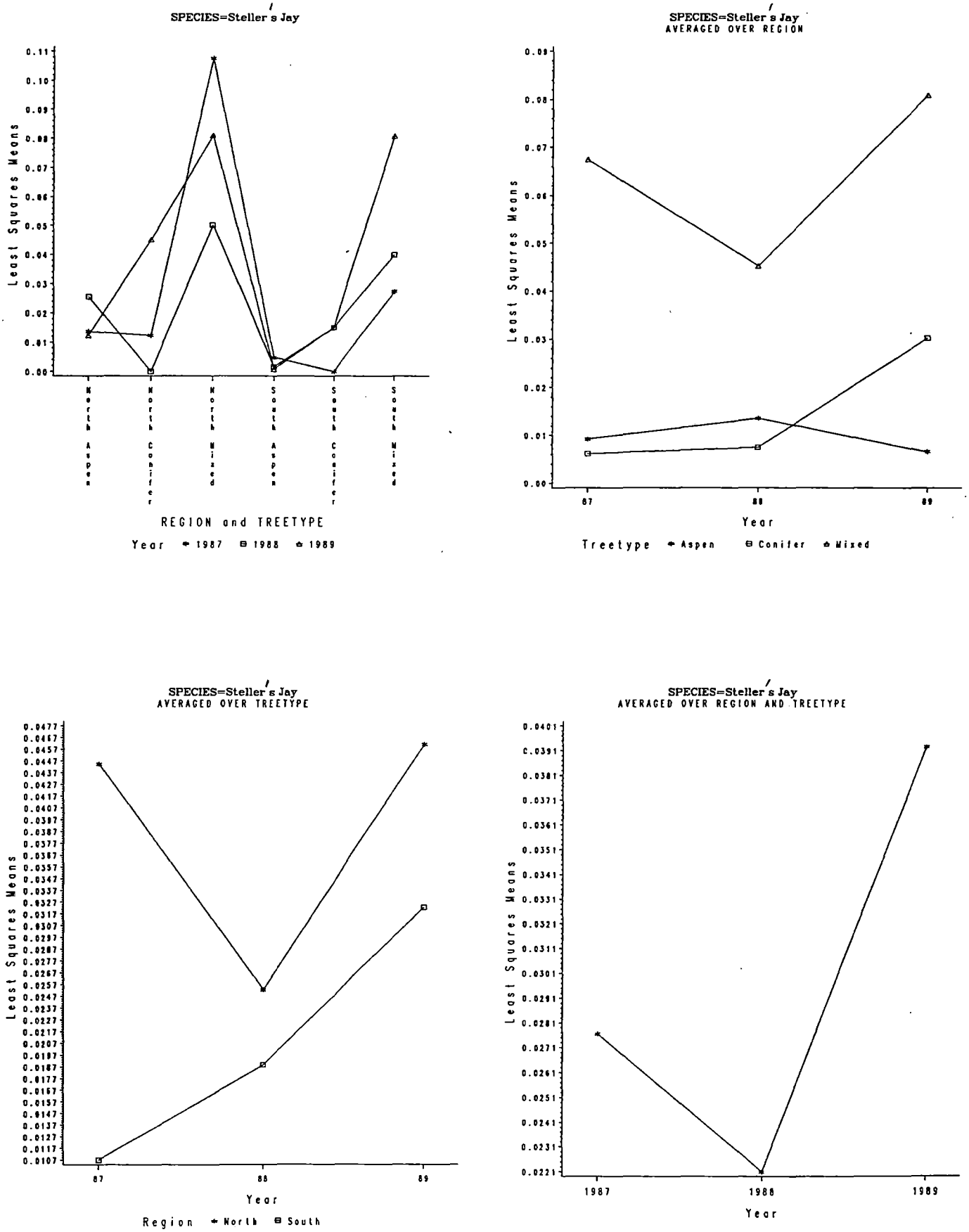
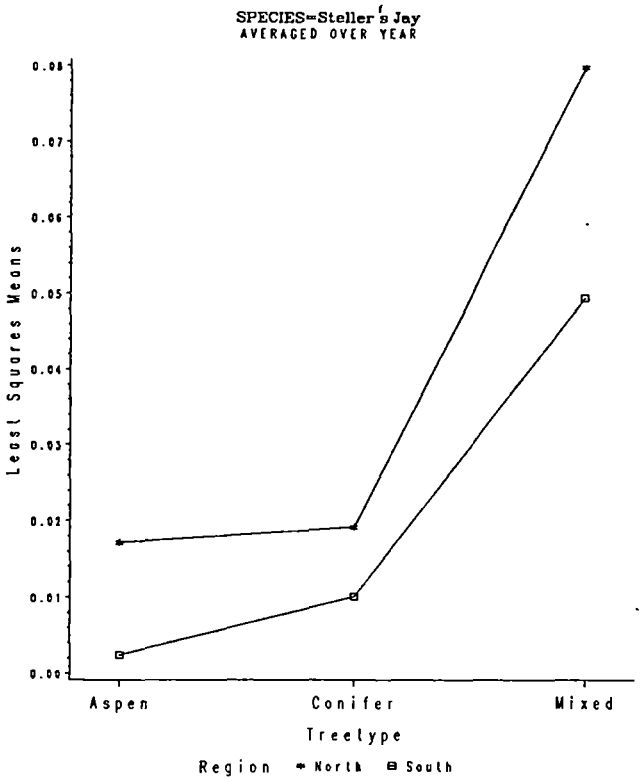
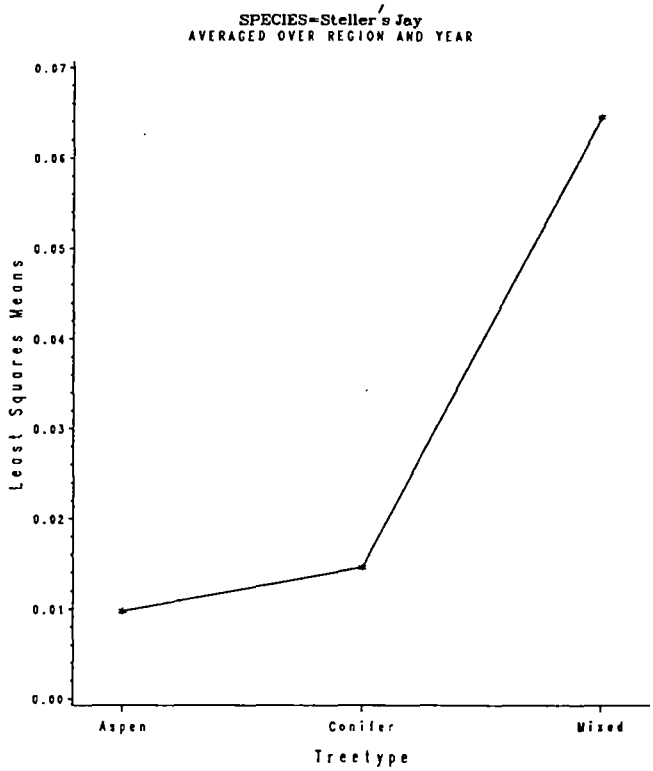


Fig. 34 (cont).


SPECIES=Steller's Jay
AVERAGED OVER YEAR
Least Squares Means
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Steller's Jay
AVERAGED OVER REGION AND YEAR
Least Squares Means
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Aspen
Conifer
Mixed
Treetype

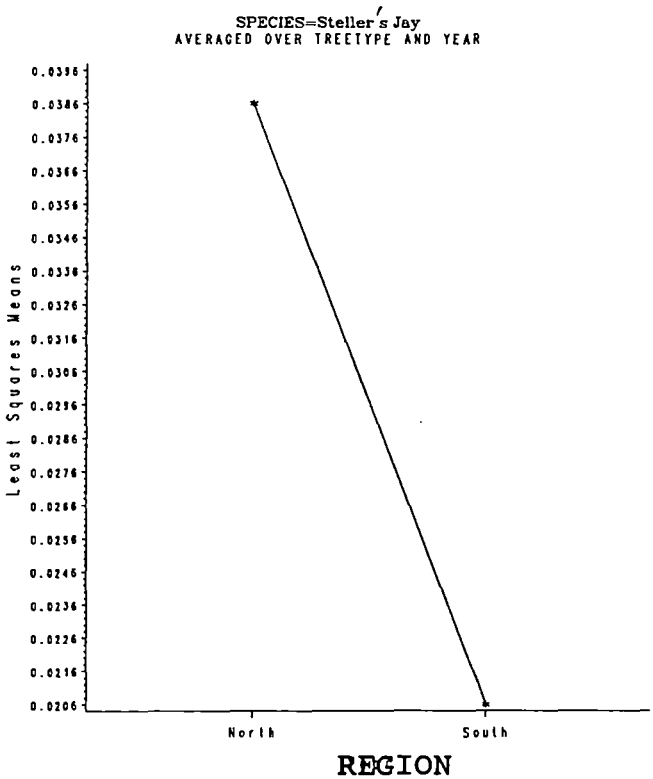
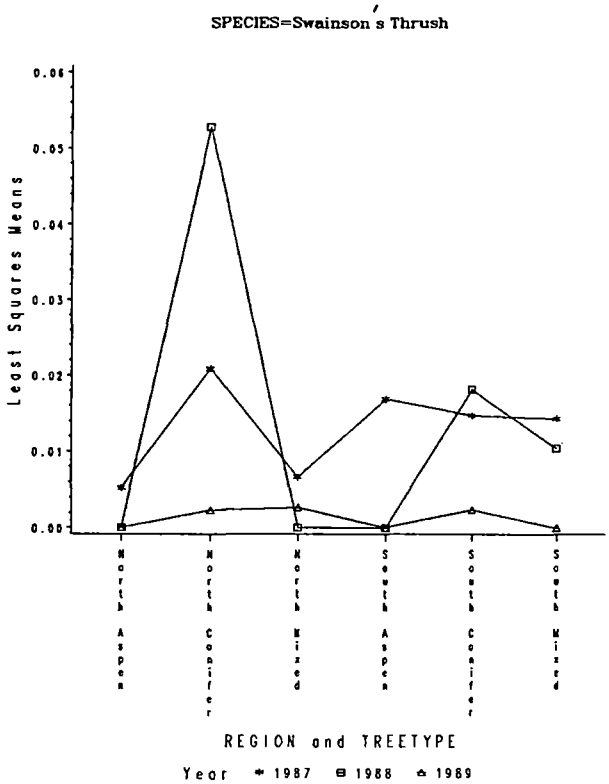
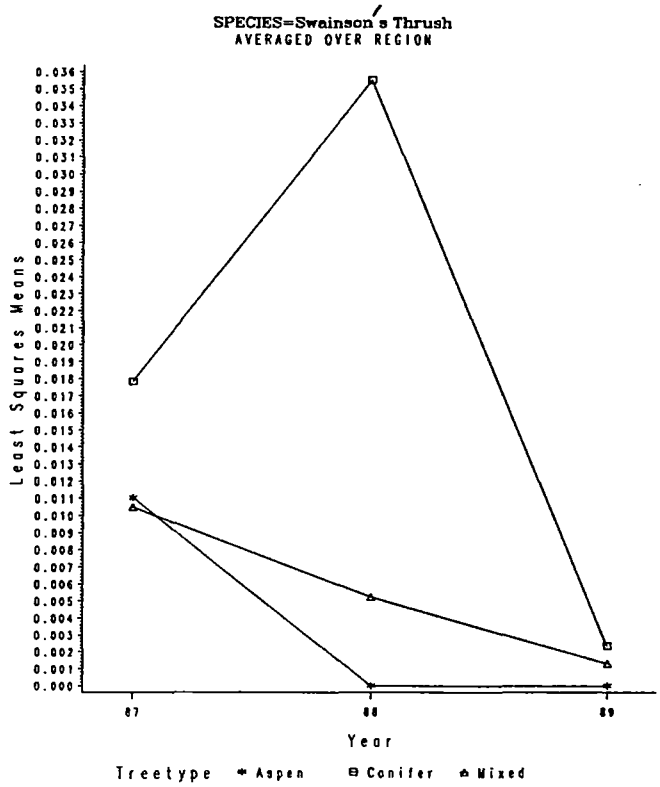
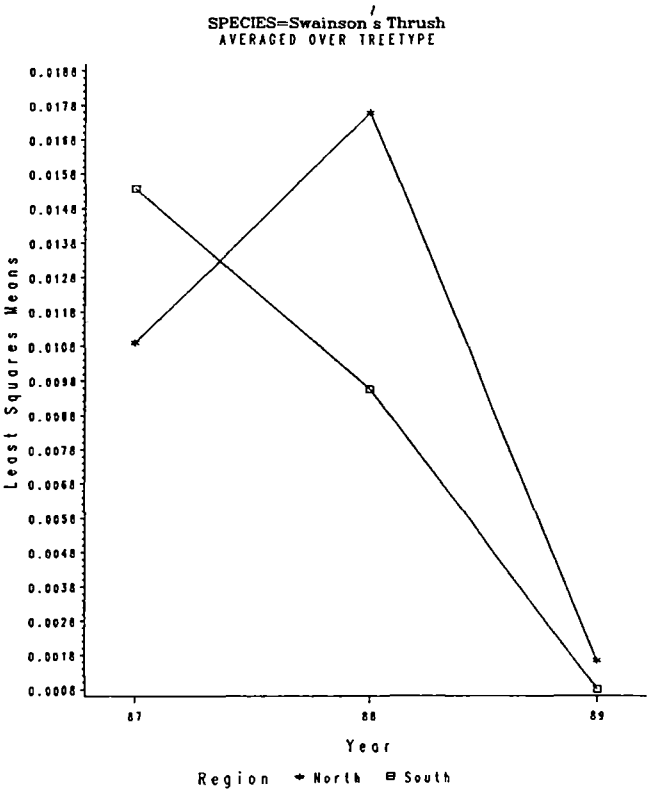

SPECIES=Steller's Jay
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
0.0396
0.0386
0.0376
0.0366
0.0356
0.0346
0.0336
0.0326
0.0316
0.0306
0.0296
0.0286
0.0276
0.0266
0.0256
0.0246
0.0236
0.0226
0.0216
0.0206
North
South
REGION

Fig. 35. Least squares means for Swainson's Thrush in 6 habitats.







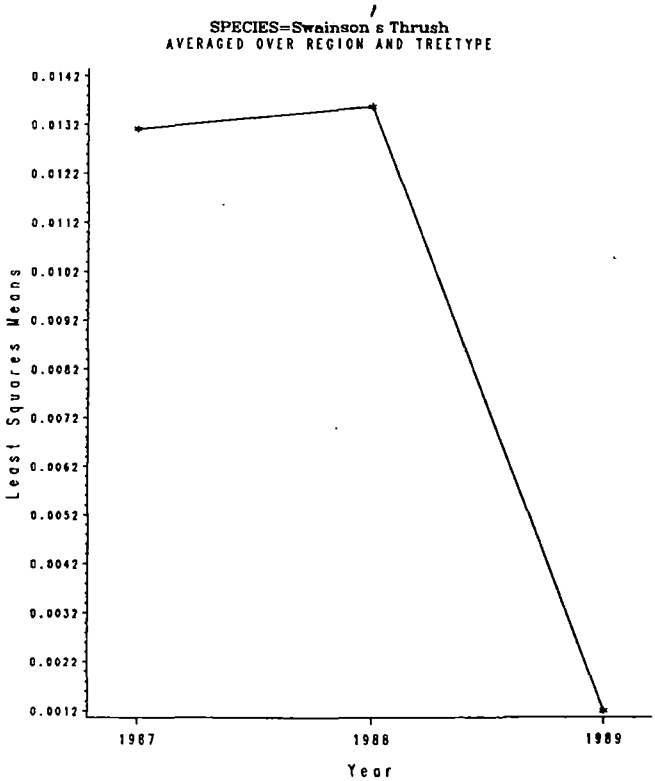
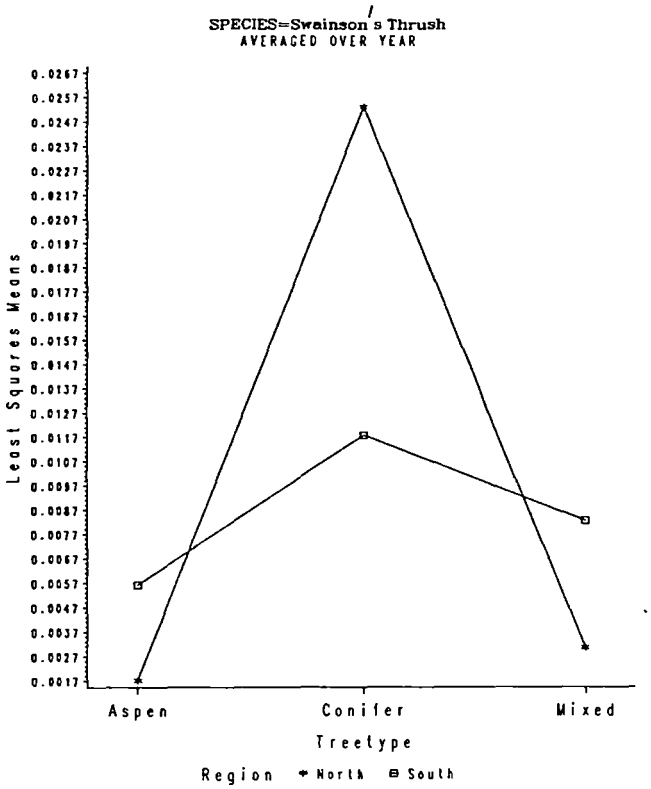
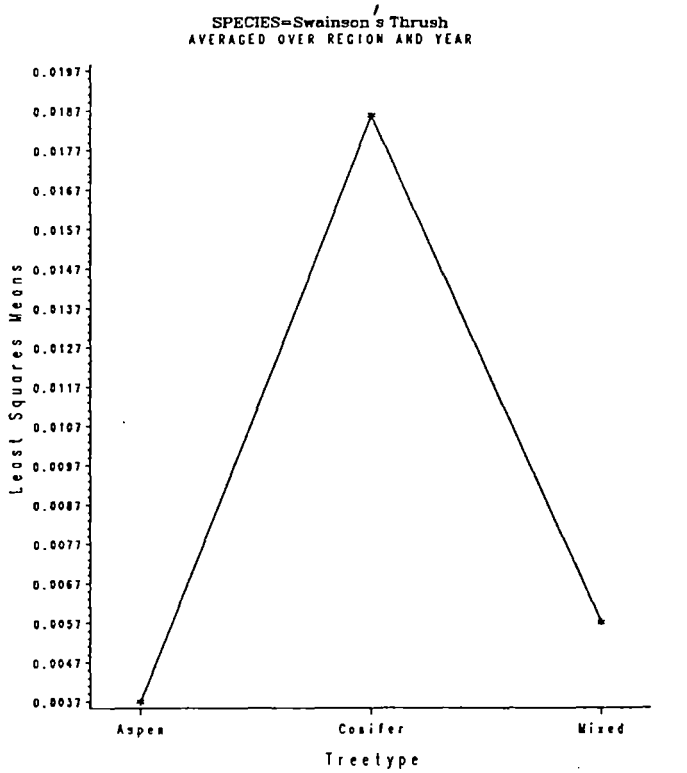


Fig. 35 (cont).


SPECIES=Swainson's Thrush
AVERAGED OVER YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Swainson's Thrush
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

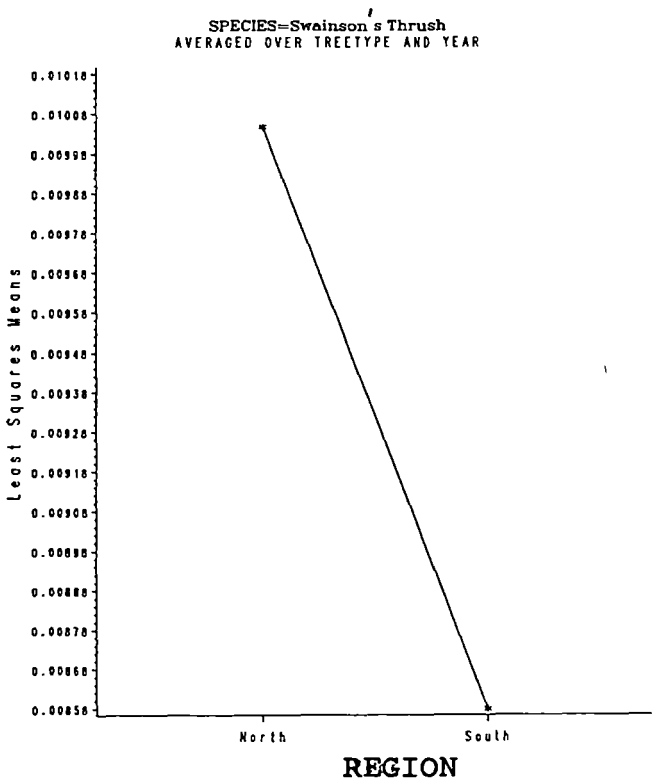
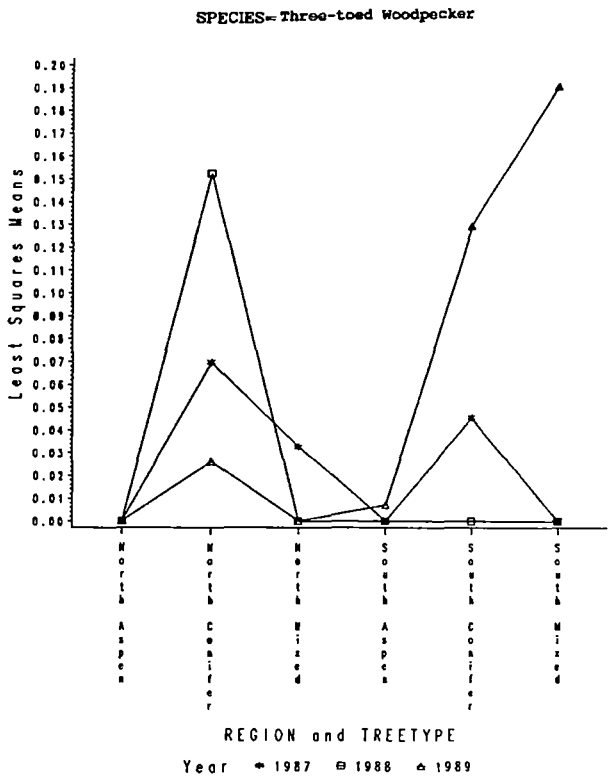
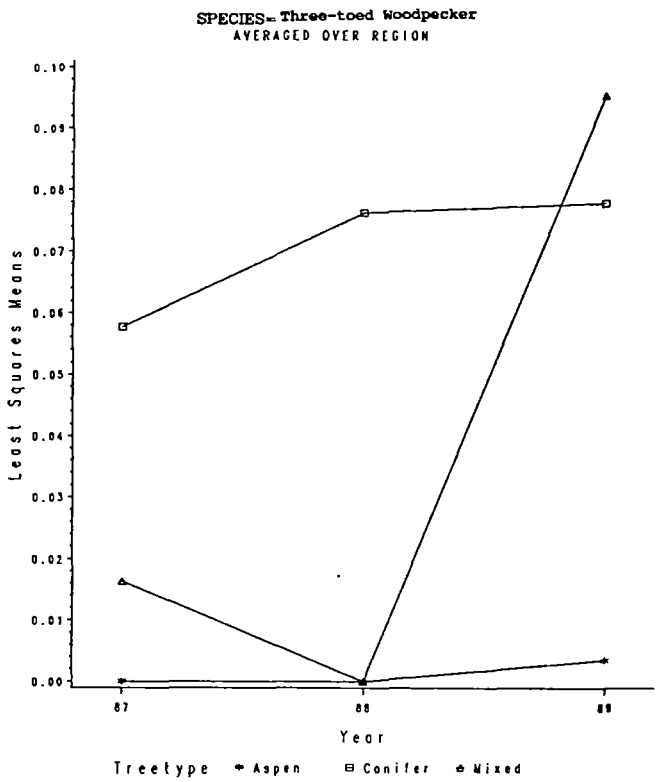
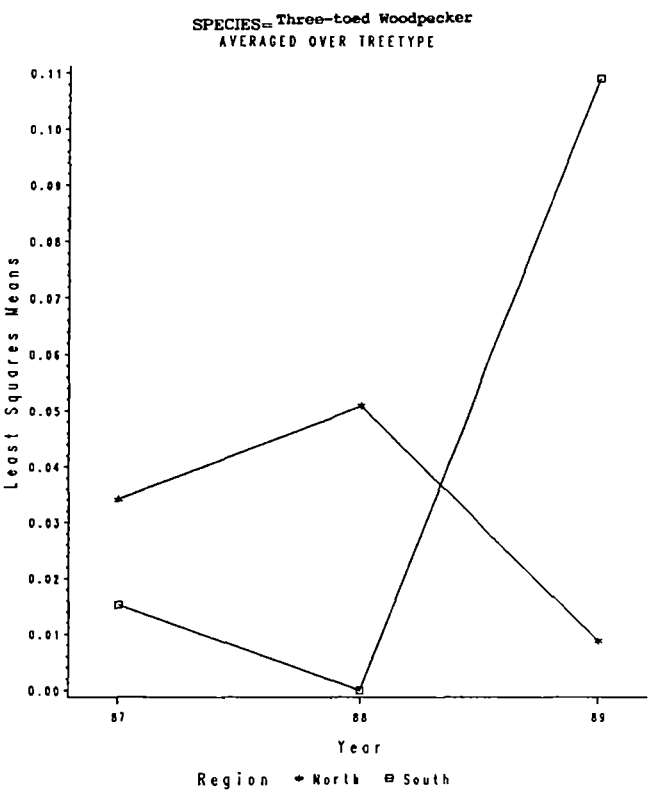

SPECIES=Swainson's Thrush
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

Fig. 36. Least squares means for Three-toed Woodpecker in 6 habitats.







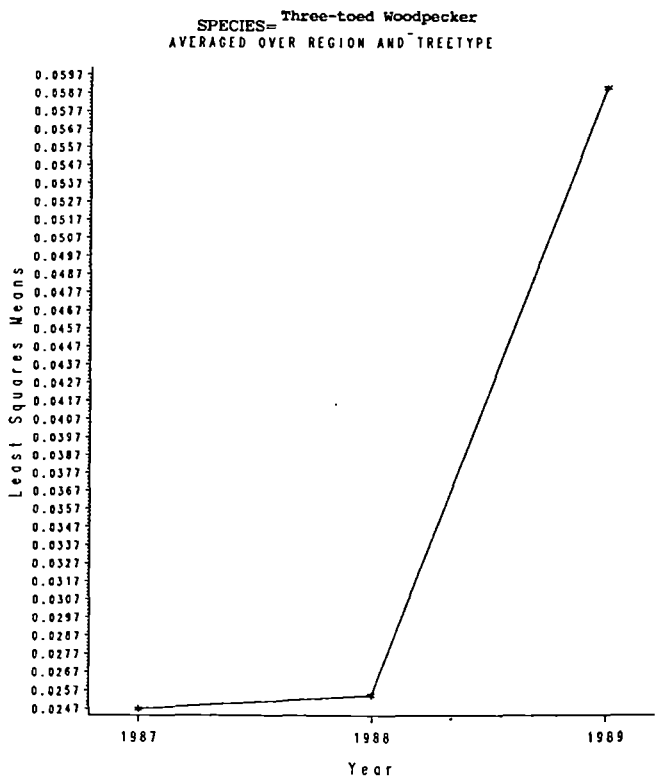
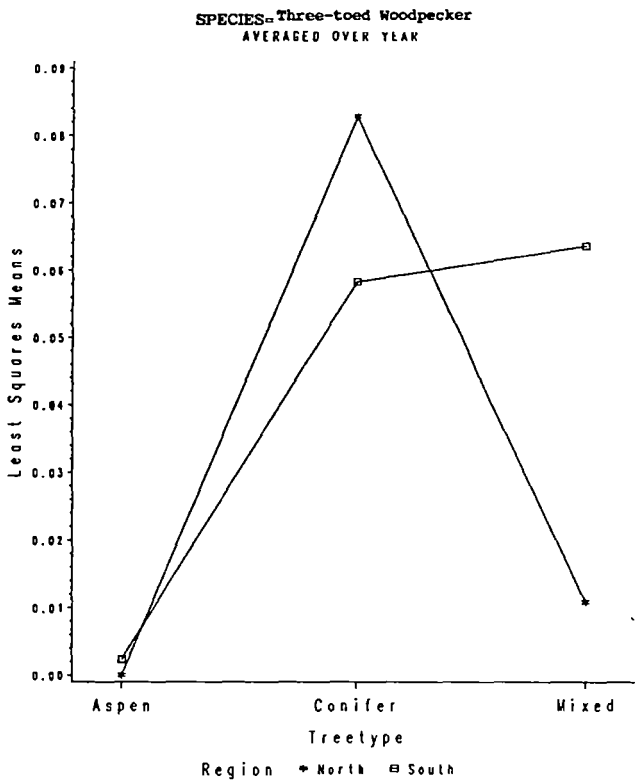
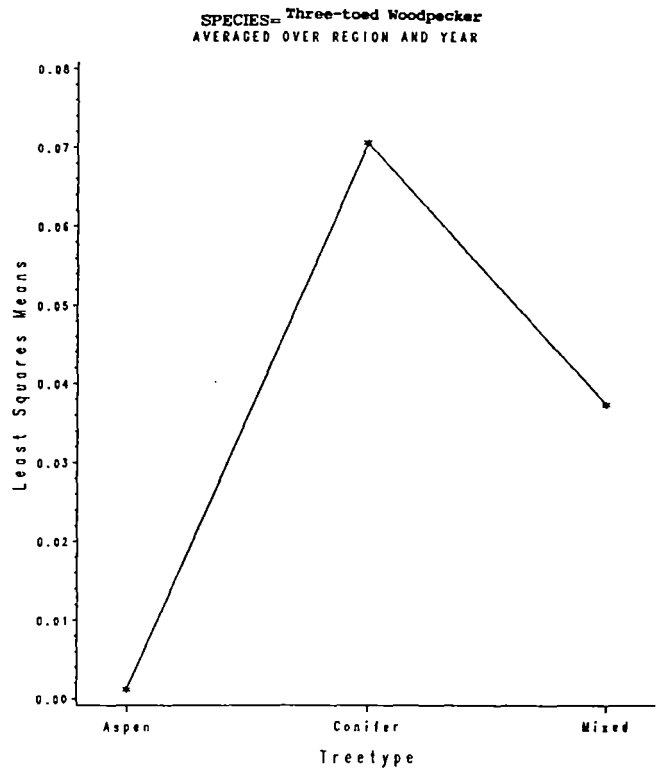


Fig. 36 (cont).


SPECIES= Three-toed Woodpecker
AVERAGED OVER YEAR
Least Squares Means
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES= Three-toed Woodpecker
AVERAGED OVER REGION AND YEAR
Least Squares Means
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Aspen
Conifer
Mixed
Treetype

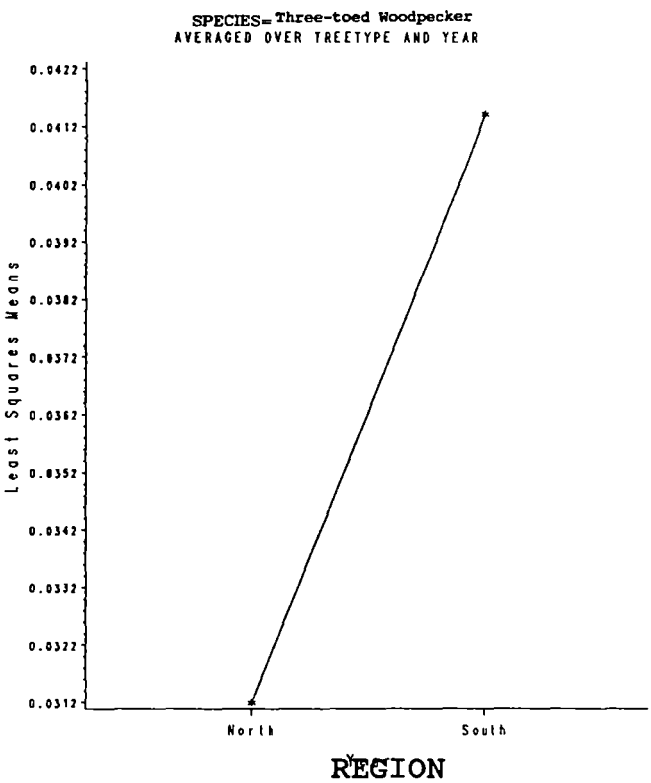
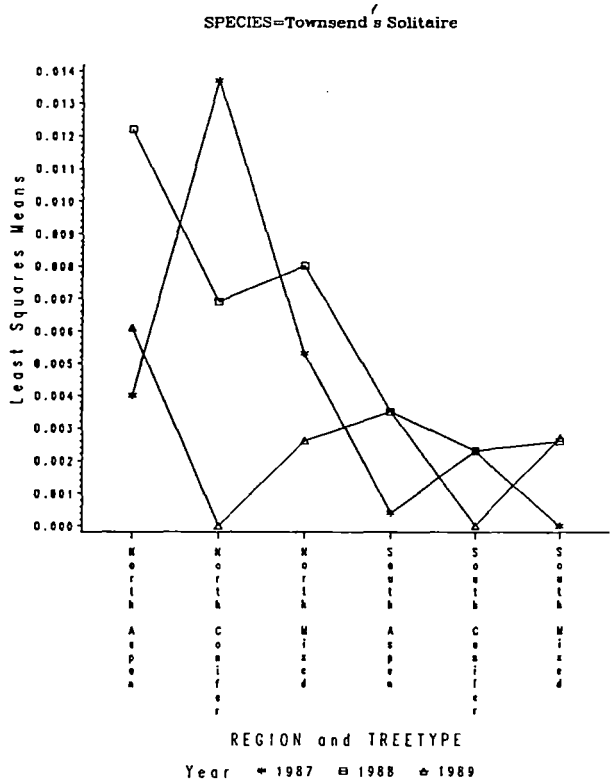
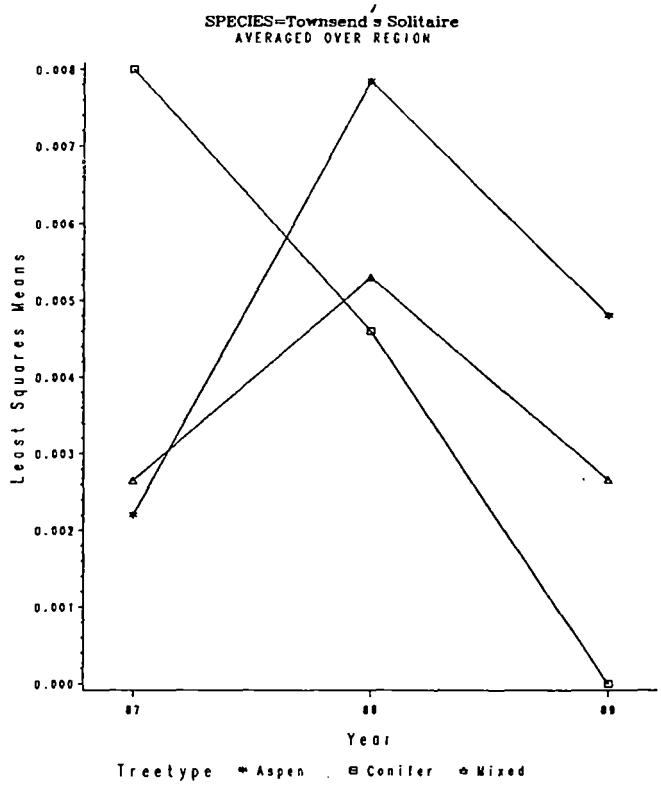
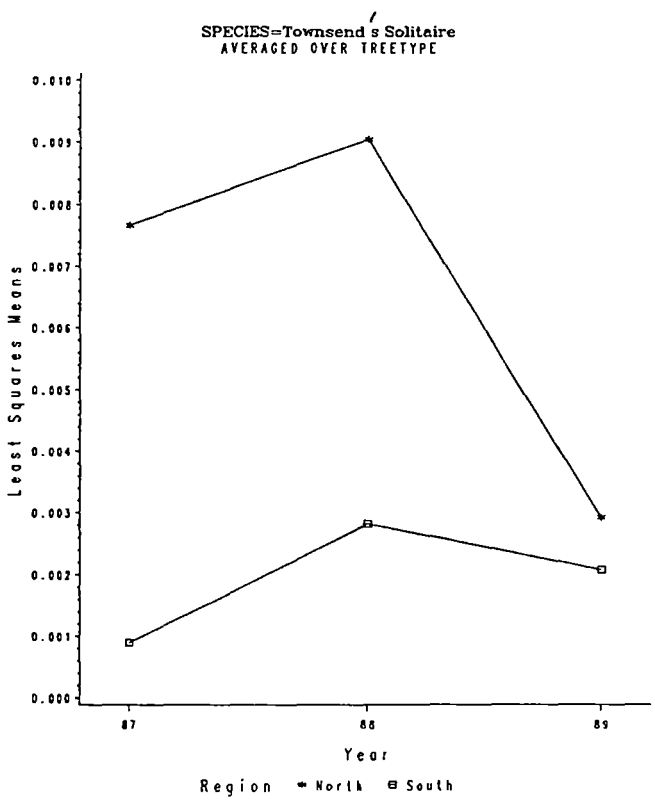

SPECIES= Three-toed Woodpecker
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
0.0422
0.0412
0.0402
0.0392
0.0382
0.0372
0.0362
0.0352
0.0342
0.0332
0.0322
0.0312
North
South
REGION

Fig. 37. Least squares means for Townsend's Solitaire in 6 habitats.







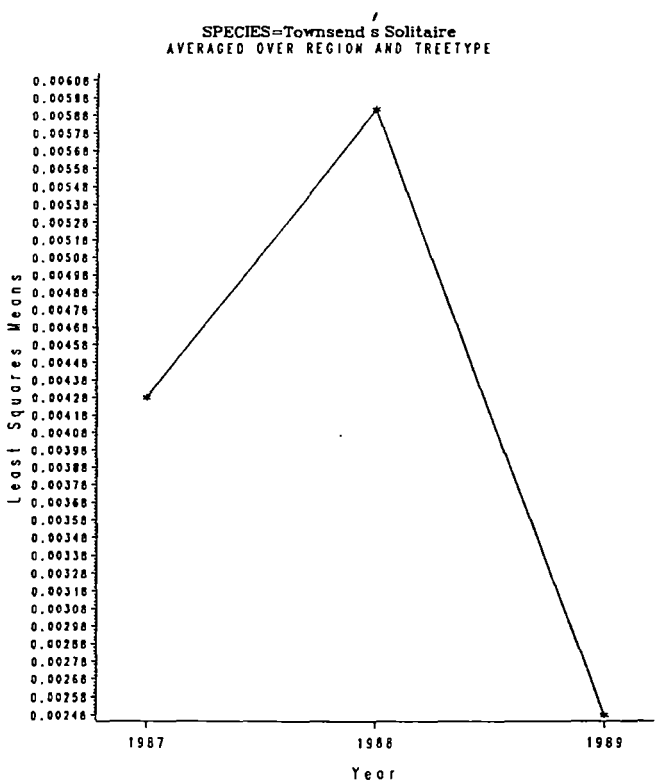
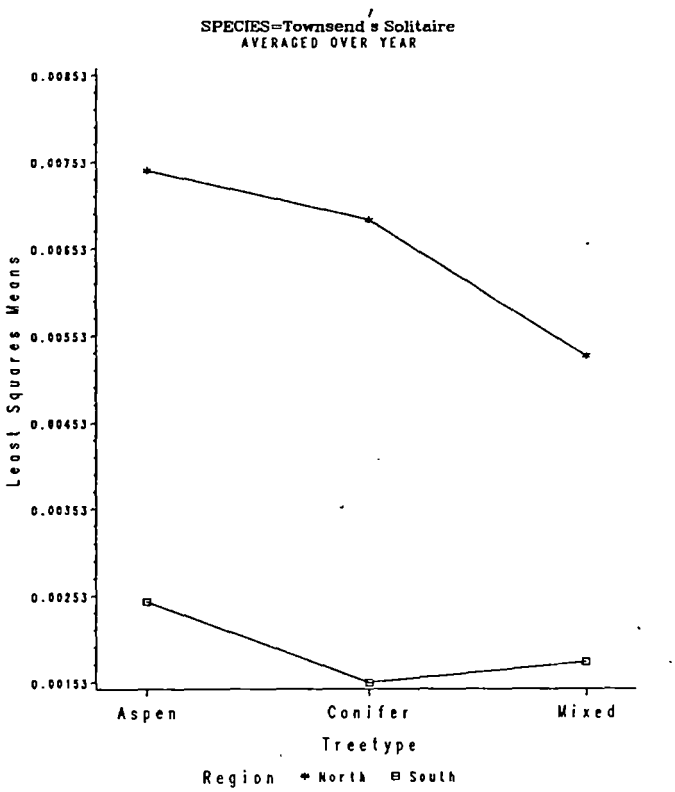
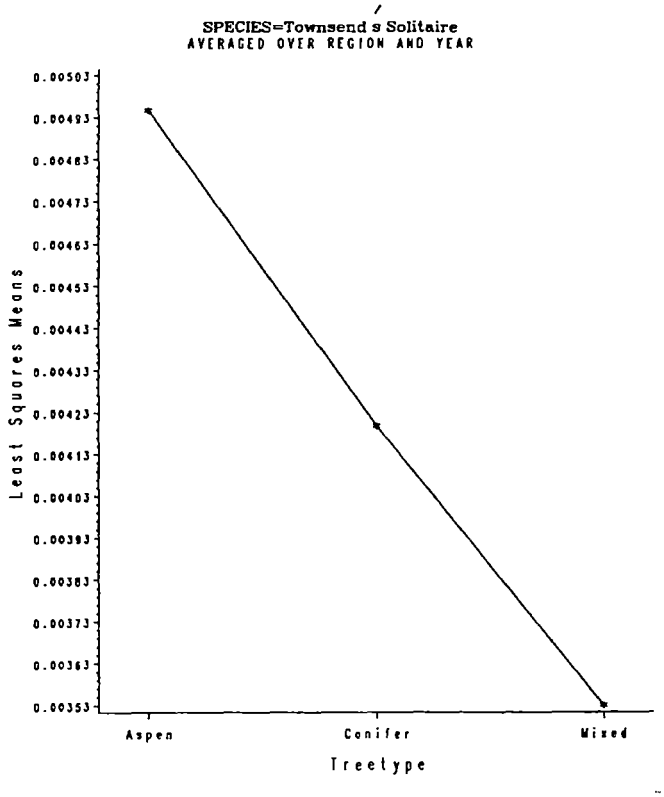


Fig. 37 (cont).


SPECIES=Townsend's Solitaire
AVERAGED OVER YEAR
Least Squares Means
0.00853
0.00753
0.00653
0.00553
0.00453
0.00353
0.00253
0.00153
Aspen
Conifer
Mixed
Treetype
Region * North ⊟ South


SPECIES=Townsend's Solitaire
AVERAGED OVER REGION AND YEAR
Least Squares Means
0.00503
0.00493
0.00483
0.00473
0.00463
0.00453
0.00443
0.00433
0.00423
0.00413
0.00403
0.00393
0.00383
0.00373
0.00363
0.00353
Aspen
Conifer
Mixed
Treetype

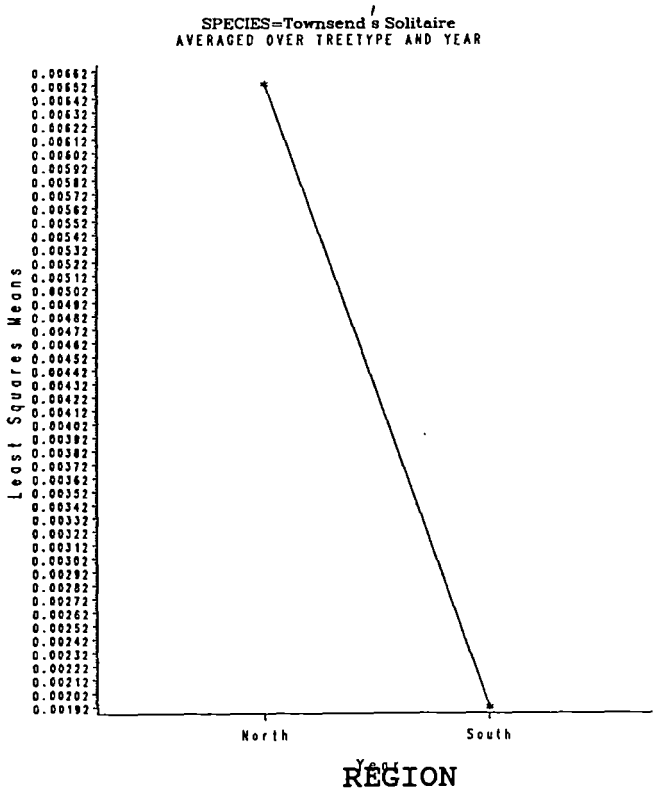
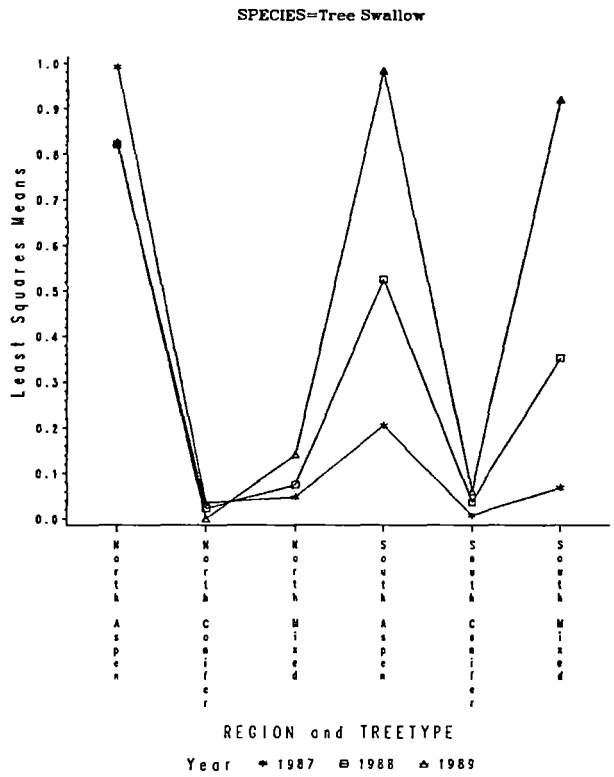
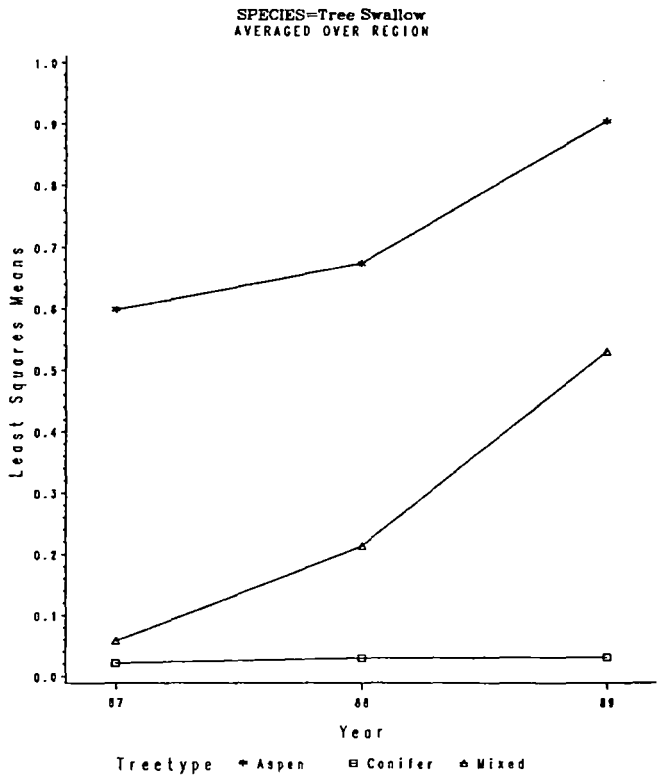
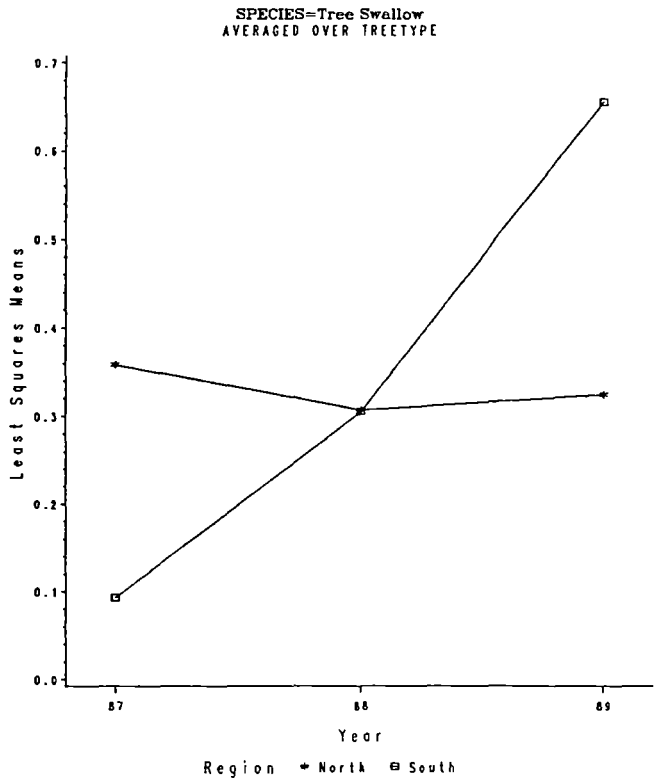

SPECIES=Townsend's Solitaire
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
Year
REGION

Fig. 38. Least squares means for Tree Swallow in 6 habitats.







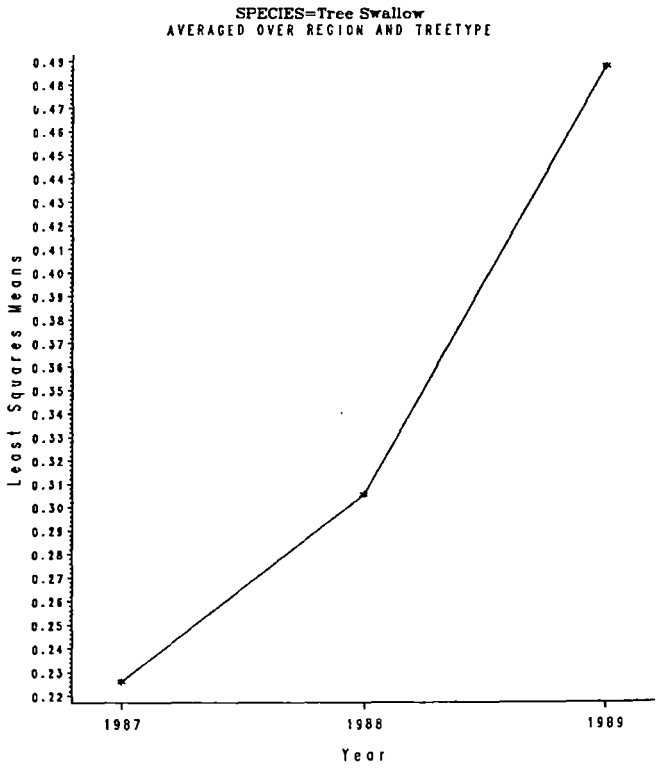
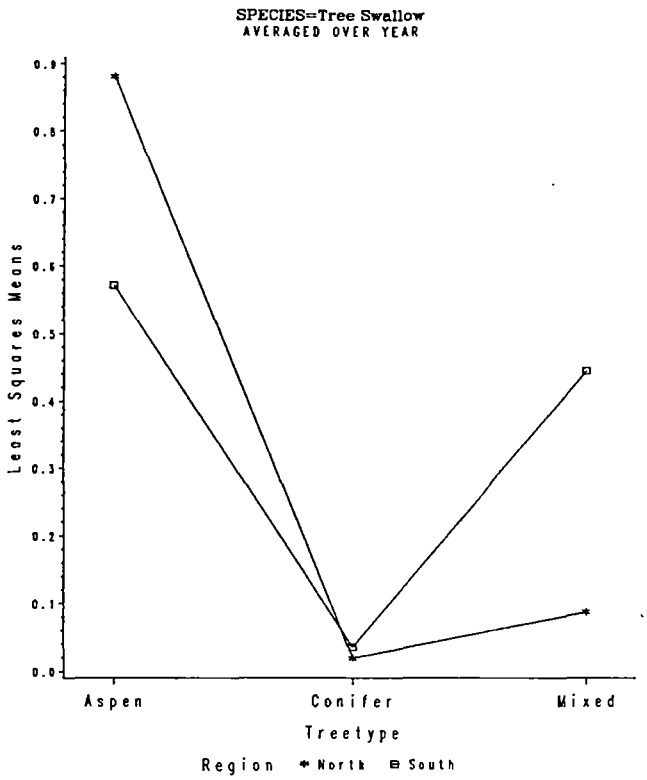
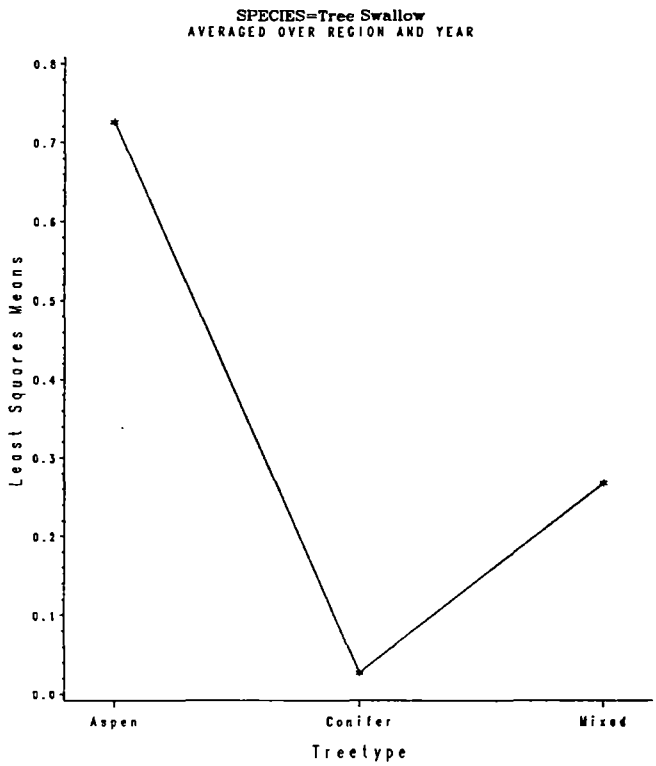


Fig. 38 (cont).


SPECIES=Tree Swallow
AVERAGED OVER YEAR
Least Squares Means
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Aspen
Conifer
Mixed
Treetype
Region * North ⊟ South


SPECIES=Tree Swallow
AVERAGED OVER REGION AND YEAR
Least Squares Means
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Aspen
Conifer
Mixed
Treetype

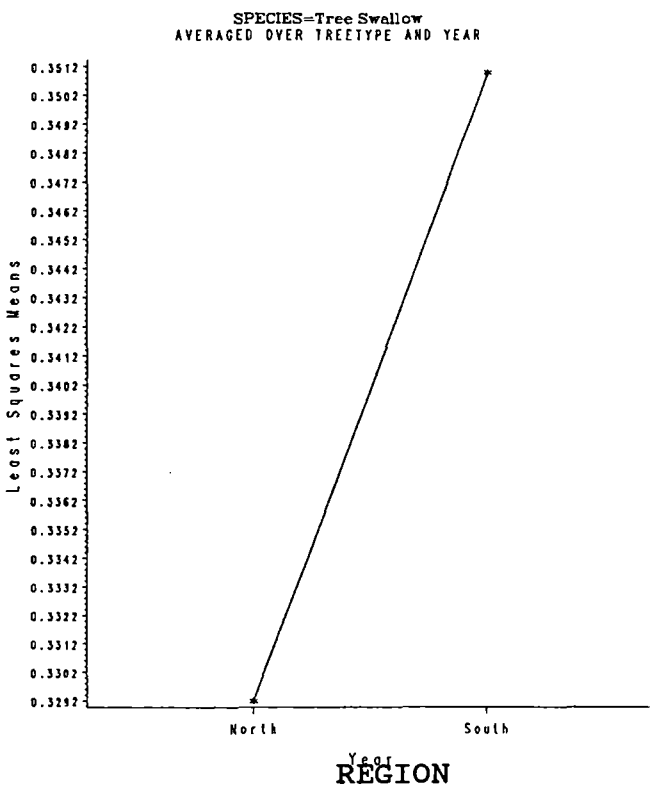
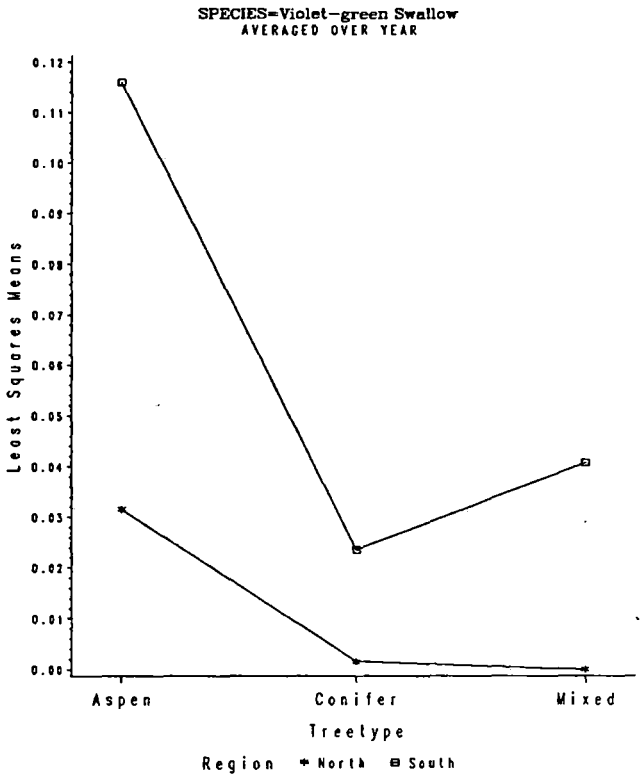
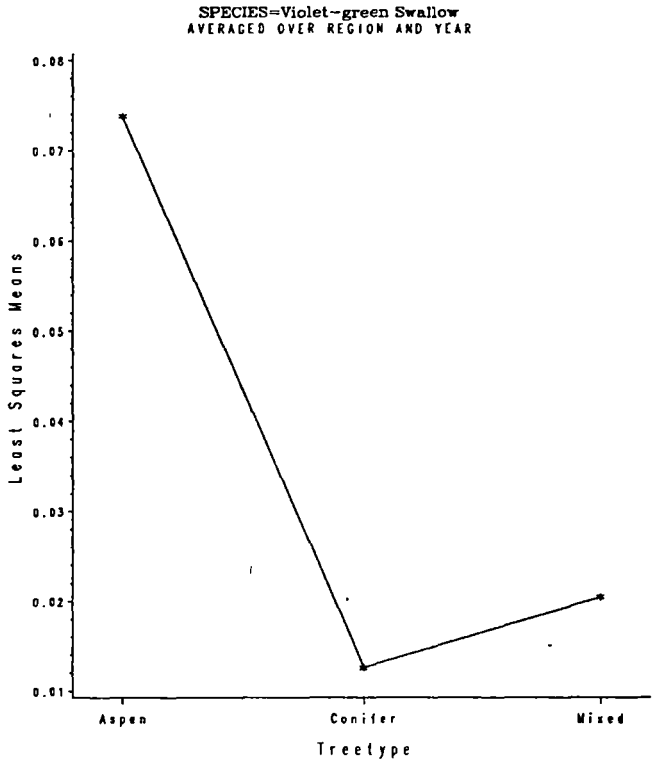
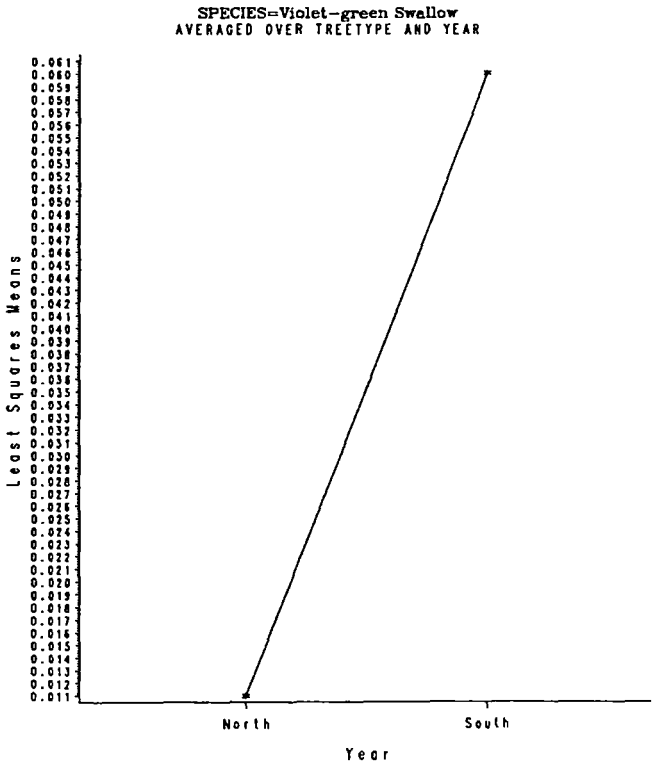
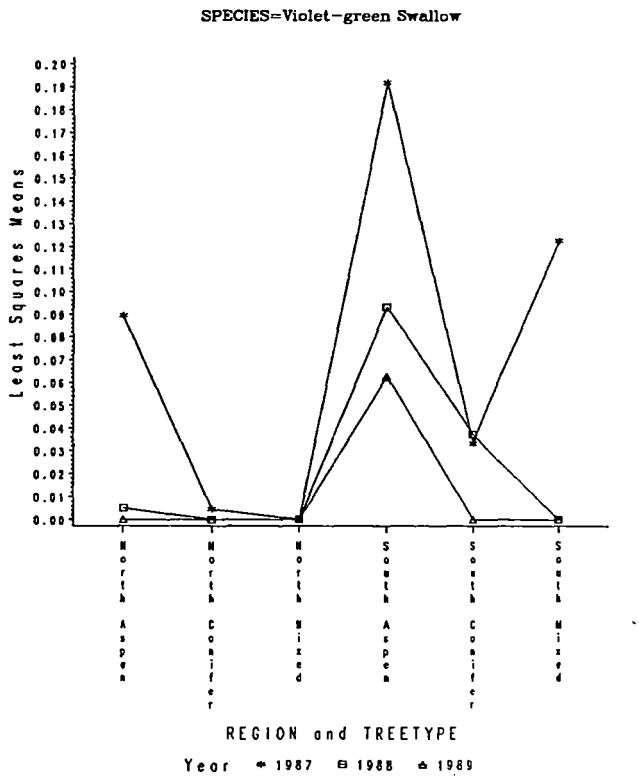

SPECIES=Tree Swallow
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
0.3512
0.3502
0.3492
0.3482
0.3472
0.3462
0.3452
0.3442
0.3432
0.3422
0.3412
0.3402
0.3392
0.3382
0.3372
0.3362
0.3352
0.3342
0.3332
0.3322
0.3312
0.3302
0.3292
North
South
Year
REGION

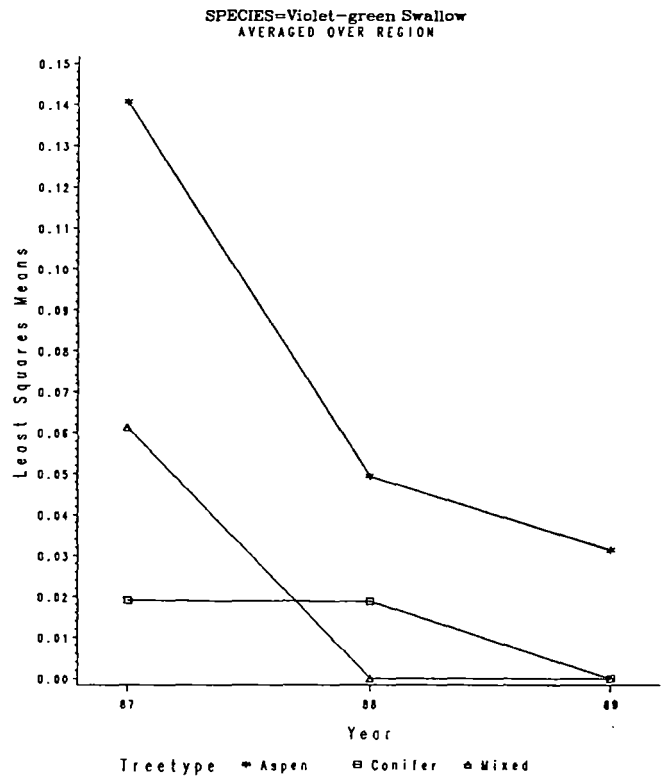
Fig. 39. Least squares means for Violet-green Swallow in 6 habitats.

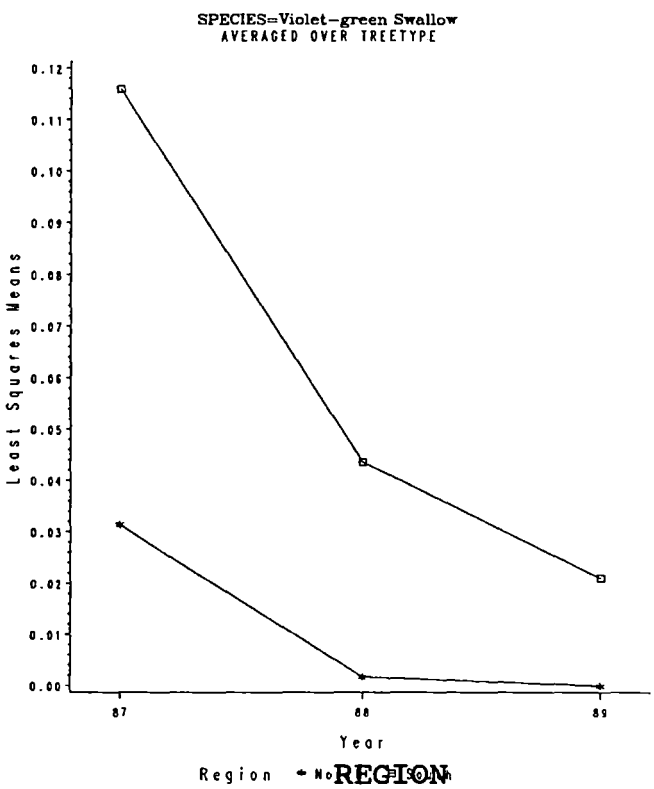







SPECIES=Violet-green Swallow
Least Squares Means
0.20
0.19
0.18
0.17
0.16
0.15
0.14
0.13
0.12
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
North Aspen
North Conifer
North Mixed
South Aspen
South Conifer
South Mixed
REGION and TREETYPE
Year * 1987 ⊟ 1988 ▲ 1989


SPECIES=Violet-green Swallow
AVERAGED OVER REGION
Least Squares Means
0.15
0.14
0.13
0.12
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
87
88
89
Year
Treetype * Aspen ⊟ Conifer ▲ Mixed


SPECIES=Violet-green Swallow
AVERAGED OVER TREETYPE
Least Squares Means
0.12
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
87
88
89
Year
Region * North ⊟ South
REGION

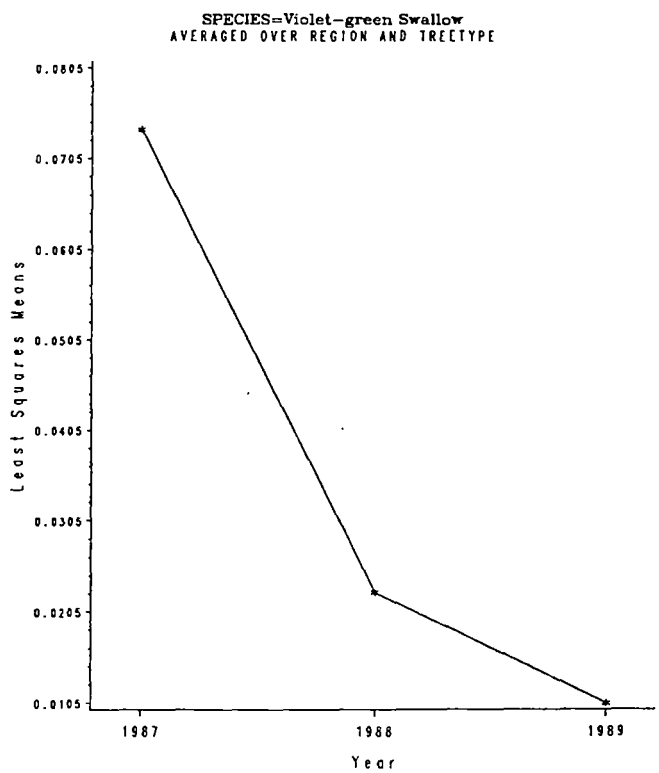
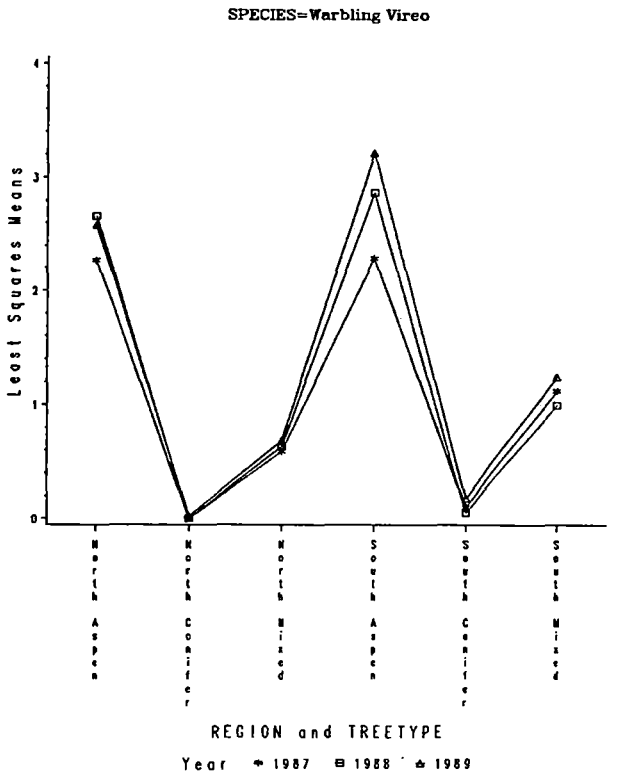
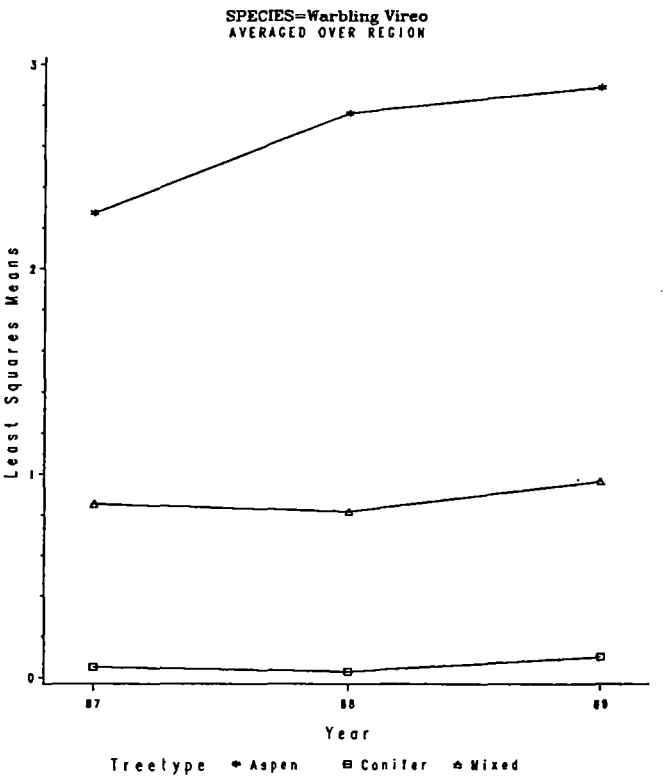
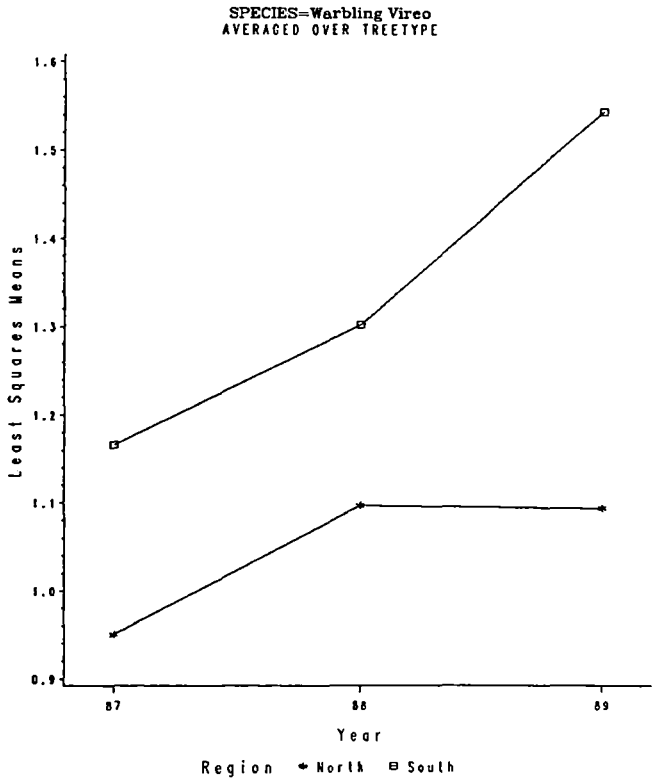
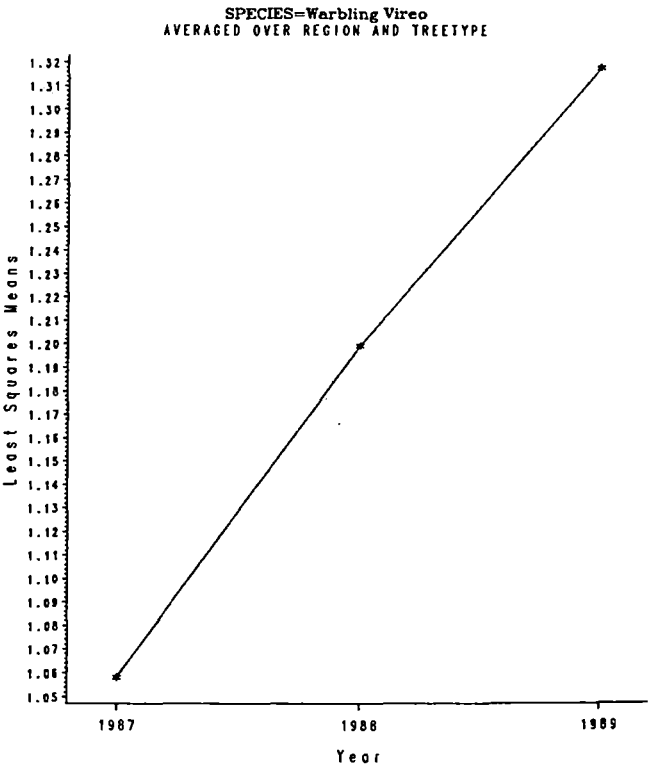

SPECIES=Violet-green Swallow
AVERAGED OVER REGION AND TREETYPE
Least Squares Means
0.0805
0.0705
0.0605
0.0505
0.0405
0.0305
0.0205
0.0105
1987
1988
1989
Year

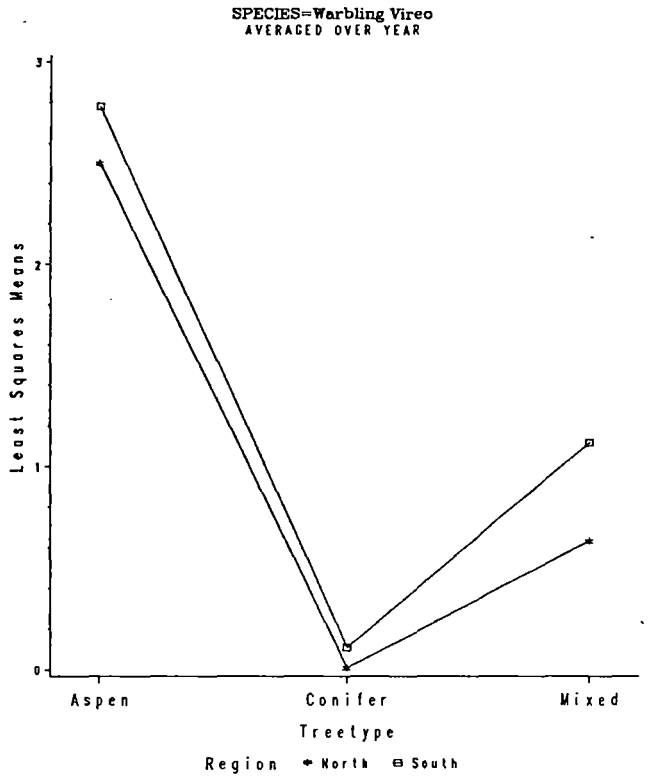
Fig. 40. Least squares means for Warbling Vireo in 6 habitats.

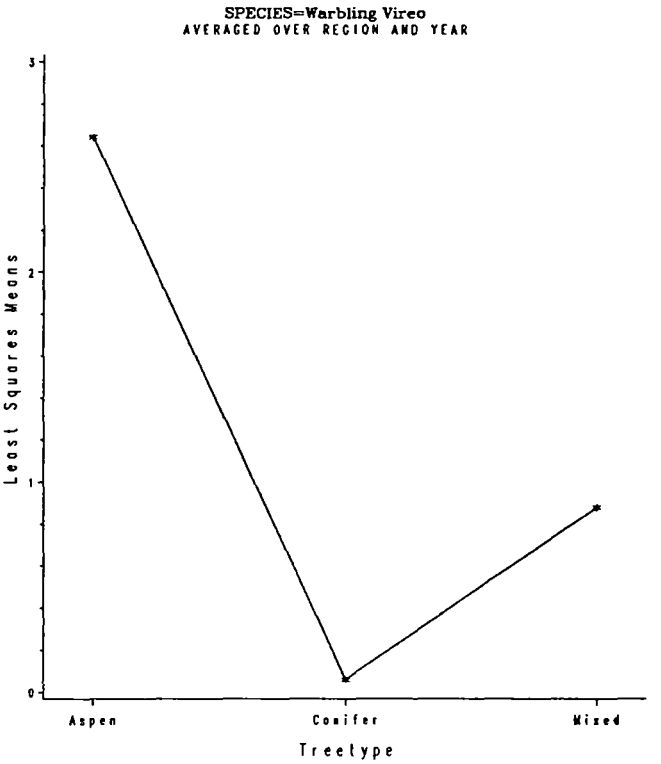









SPECIES=Warbling Vireo
AVERAGED OVER YEAR
Least Squares Means
3
2
1
0
Aspen
Conifer
Mixed
Treetype
Region
North
South


SPECIES=Warbling Vireo
AVERAGED OVER REGION AND YEAR
Least Squares Means
3
2
1
0
Aspen
Conifer
Mixed
Treetype

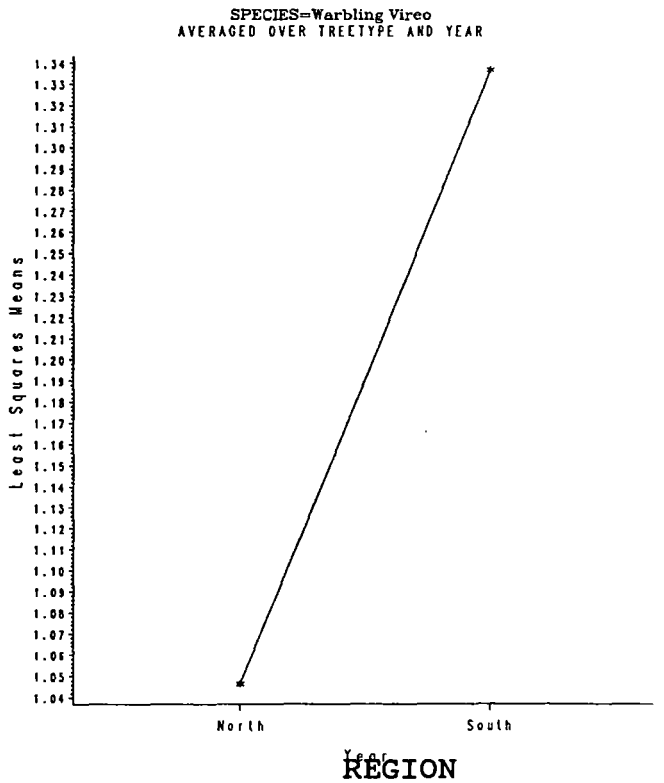
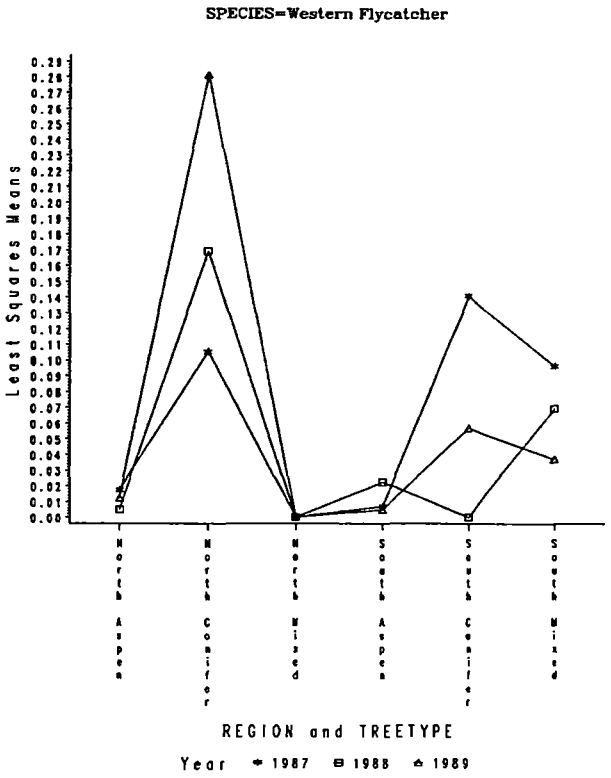
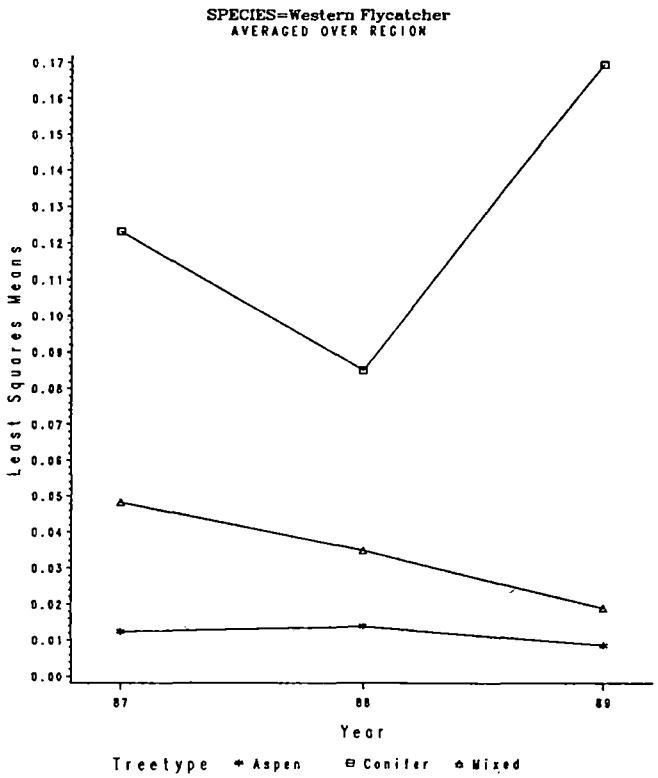
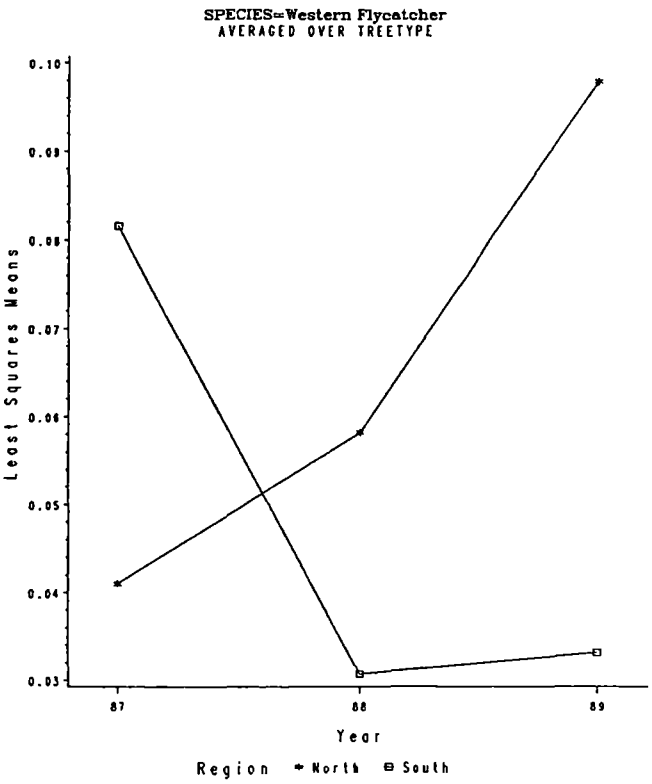
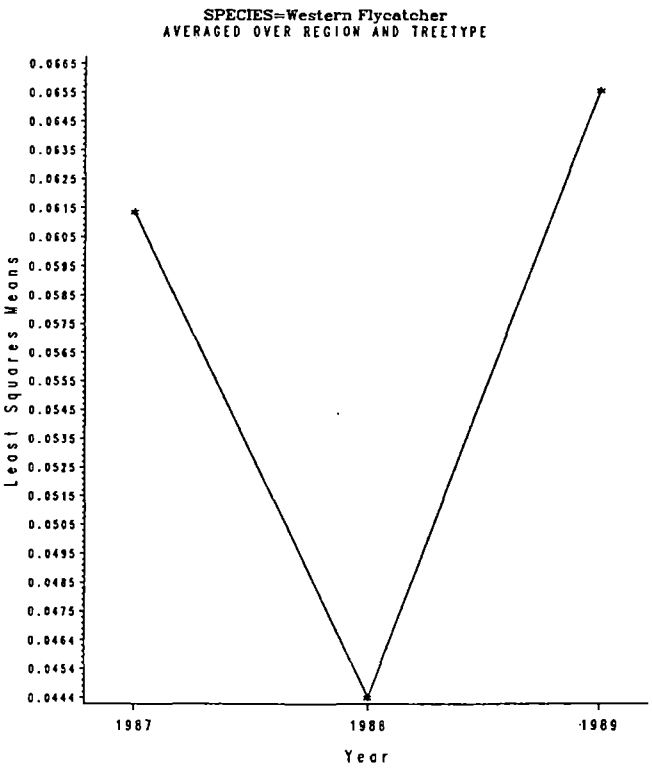

SPECIES=Warbling Vireo
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
1.34
1.33
1.32
1.31
1.30
1.29
1.28
1.27
1.26
1.25
1.24
1.23
1.22
1.21
1.20
1.19
1.18
1.17
1.16
1.15
1.14
1.13
1.12
1.11
1.10
1.09
1.08
1.07
1.06
1.05
1.04
North
South
REGION

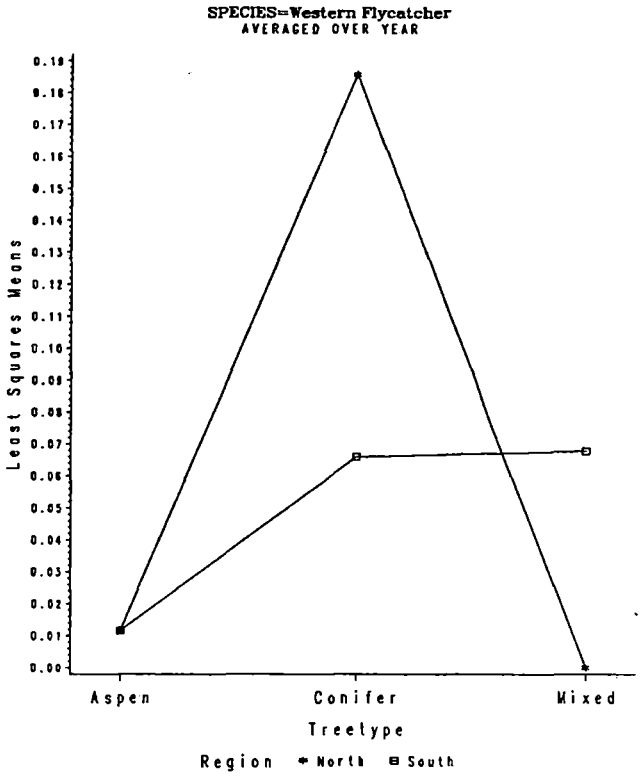
Fig. 41. Least squares means for Western Flycatcher in 6 habitats.

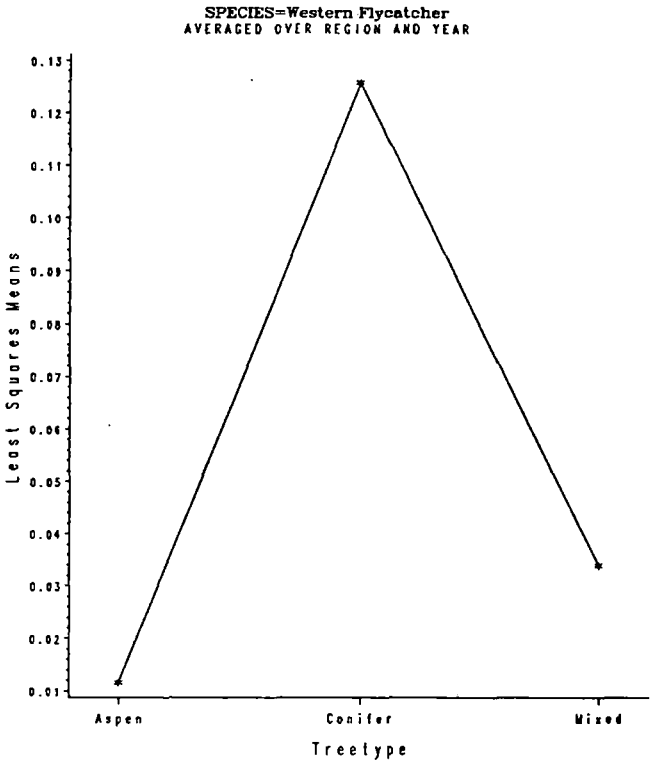









SPECIES=Western Flycatcher
AVERAGED OVER YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Western Flycatcher
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

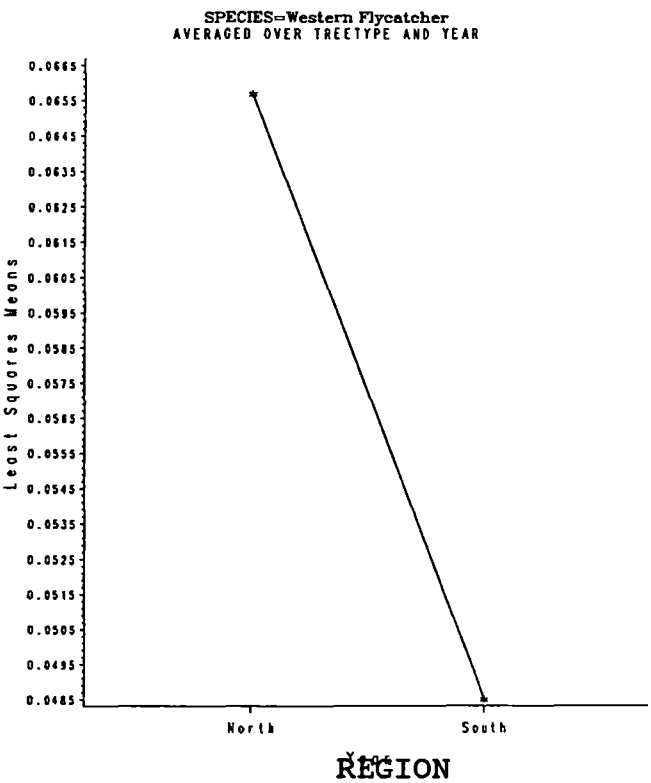
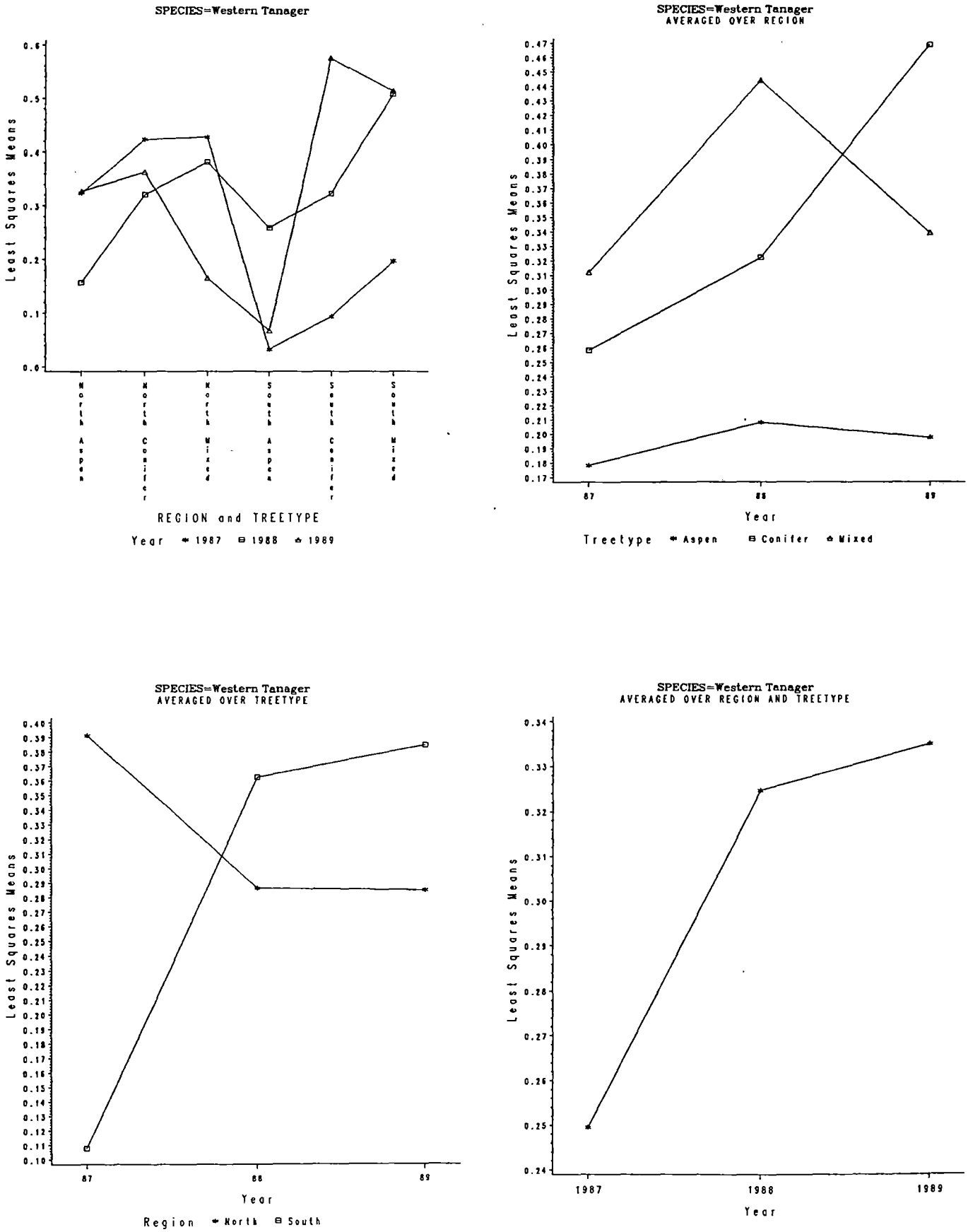
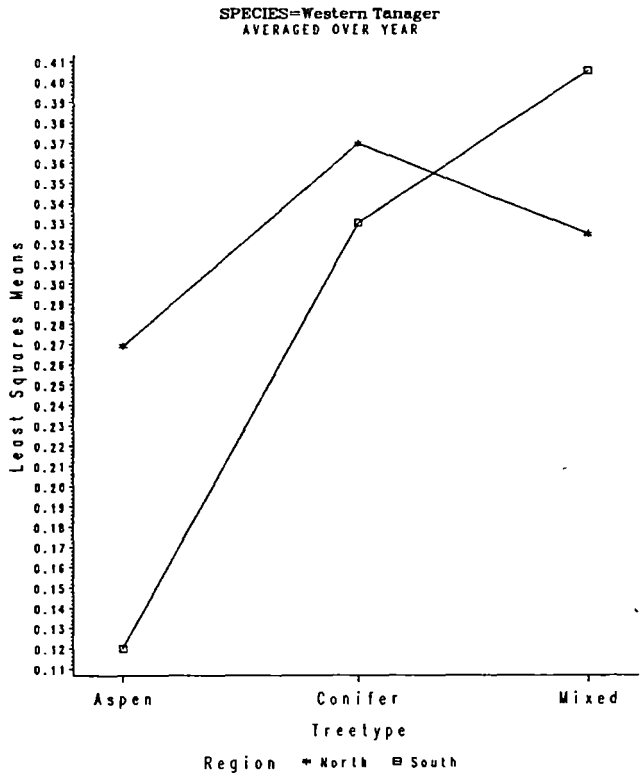
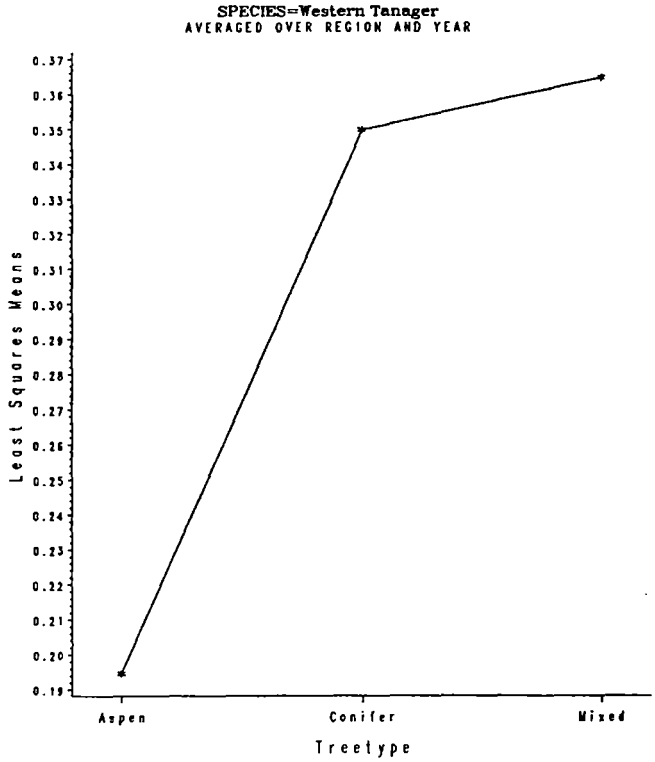

SPECIES=Western Flycatcher
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

Fig. 42. Least squares means for Western Tanager in 6 habitats.




SPECIES=Western Tanager
AVERAGED OVER YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype
Region
North
South


SPECIES=Western Tanager
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

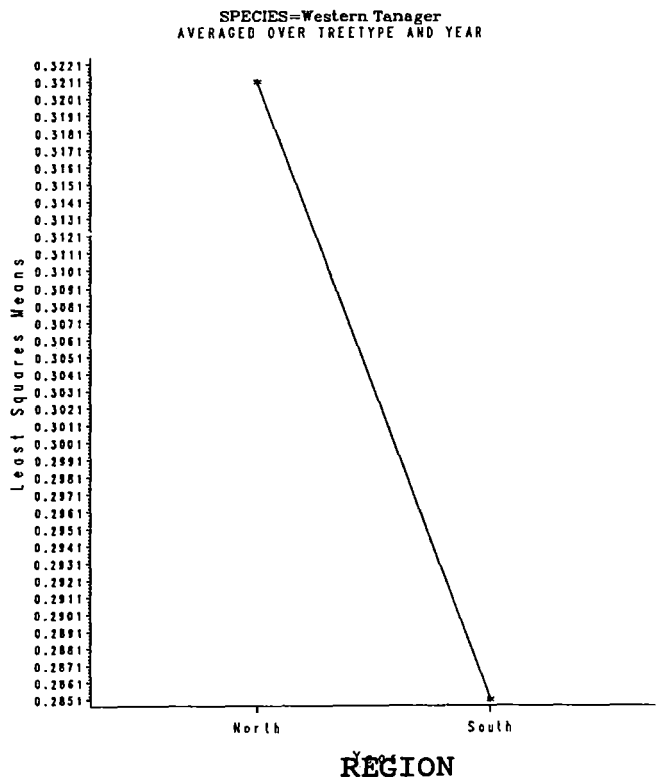
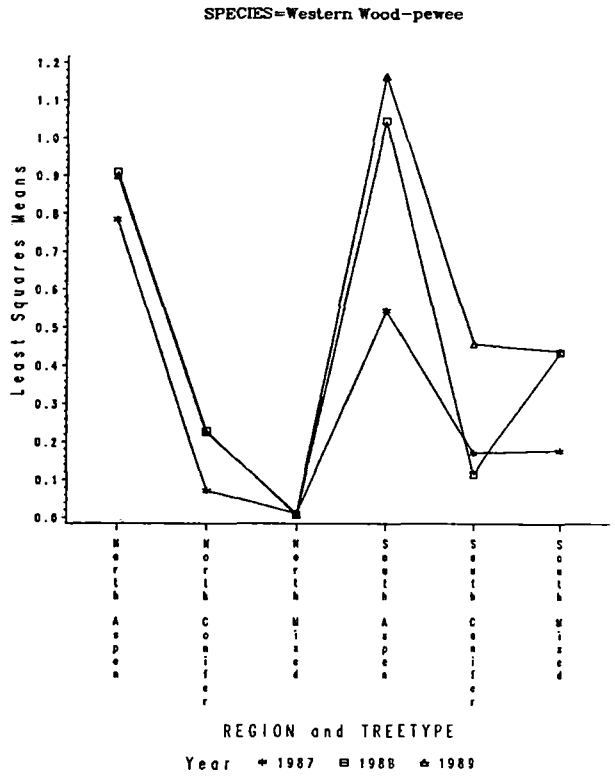
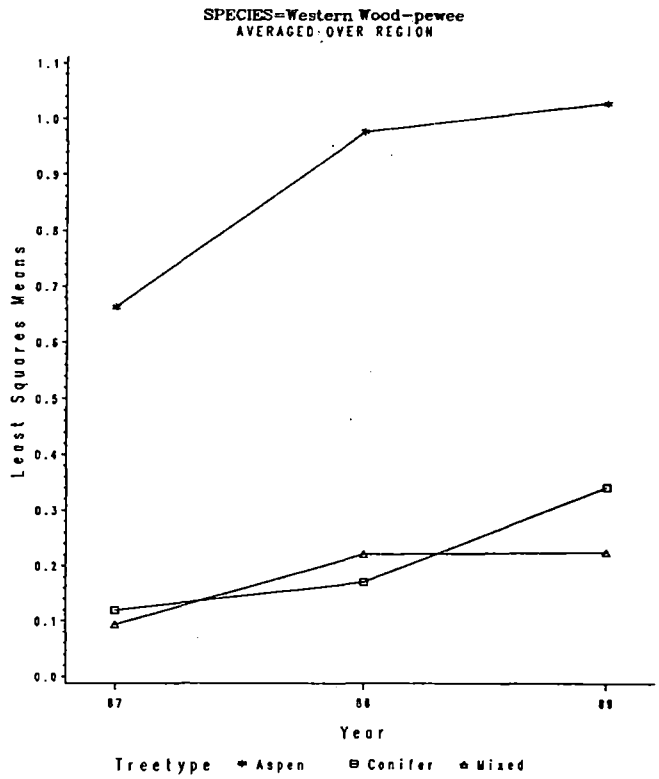

SPECIES=Western Tanager
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

Fig. 43. Least squares means for Western Wood-Pewee in 6 habitats.

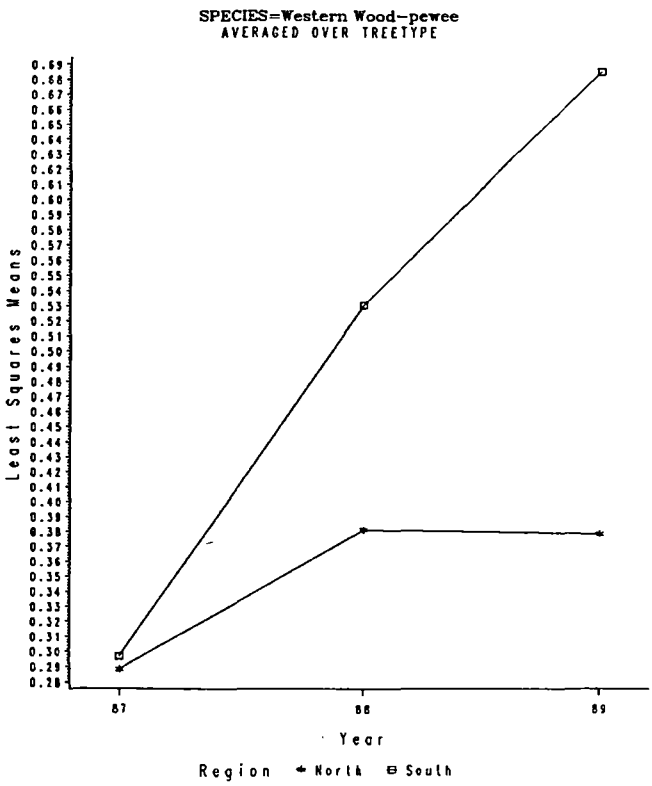
a. Year by region by treetype interaction. (P < 0.53)



b. Year by treetype interaction. (P = 0.47)



c. Year by region interaction. (P < 0.17)



d. Year main effect. (P = 0.01)

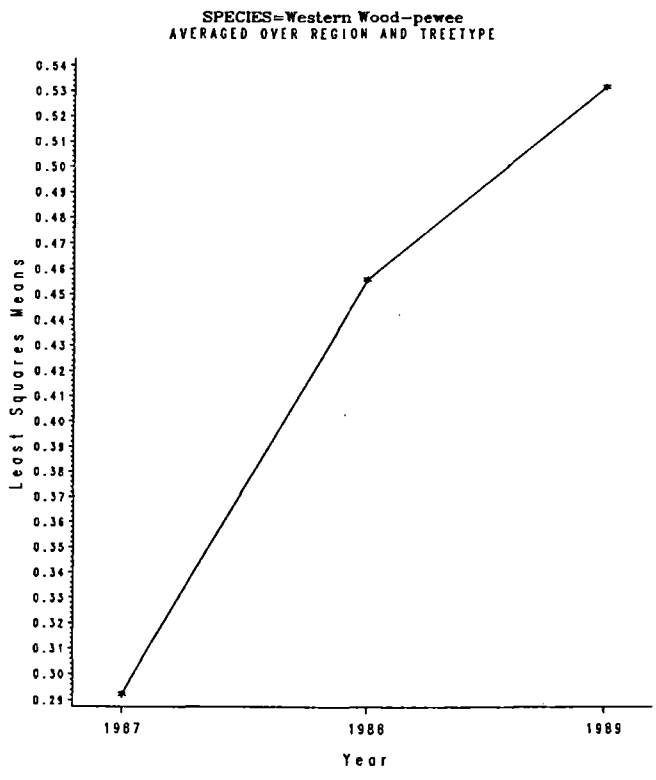
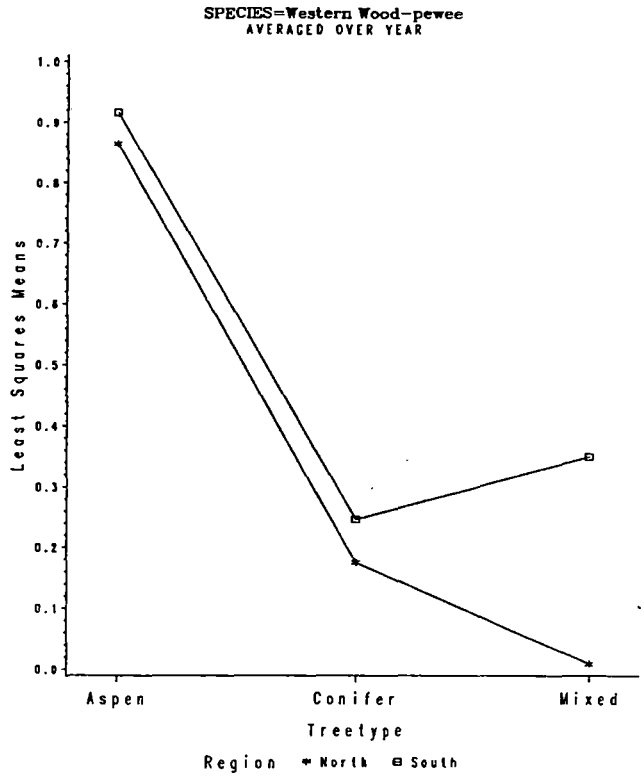
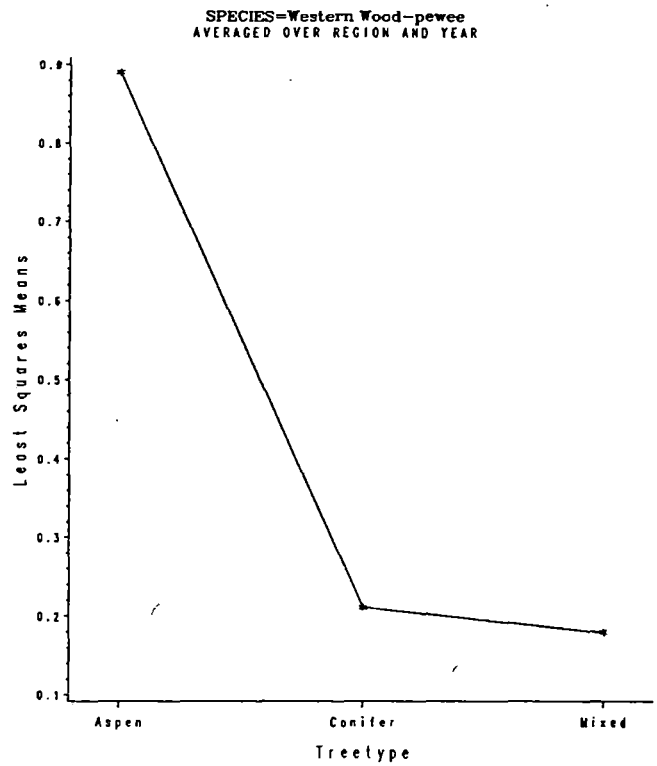


Fig. 43 (cont.).

e. Region by treetype interaction. (P = 0..80)



f. Treetype main effect. (P < 0.00)



g. Region main effect. (P = 0.43)

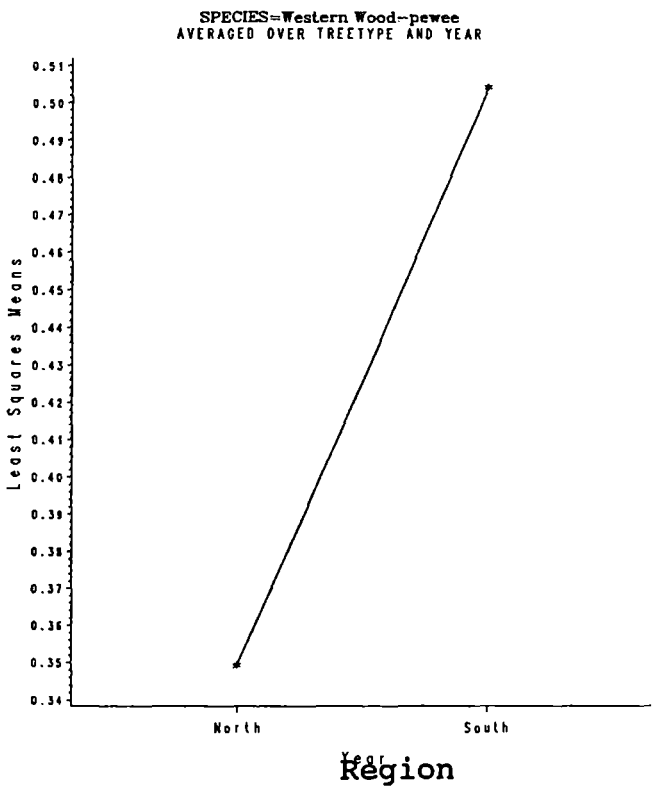


Fig. 44. Least squares means for White-breasted Nuthatch in 6 habitats.

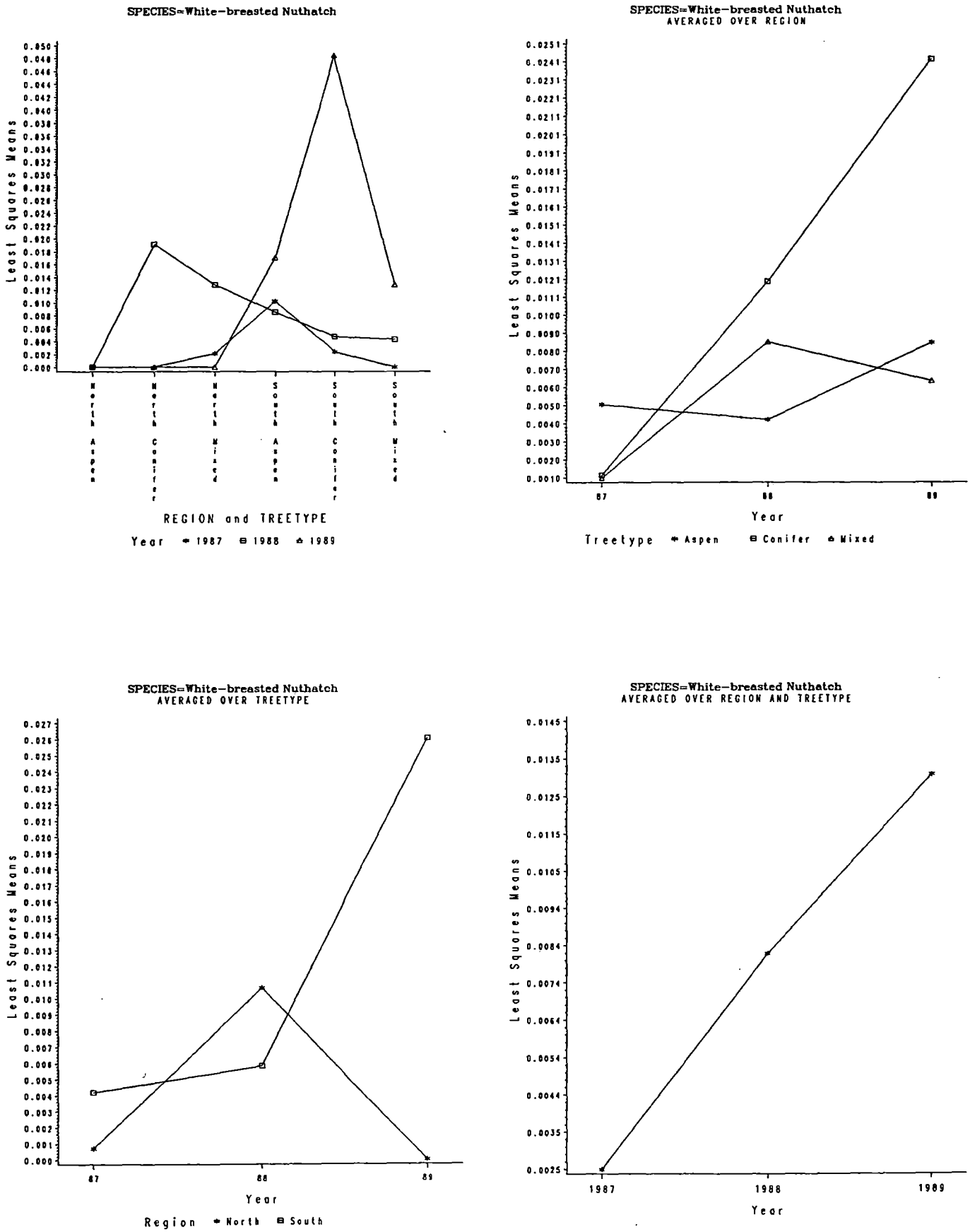
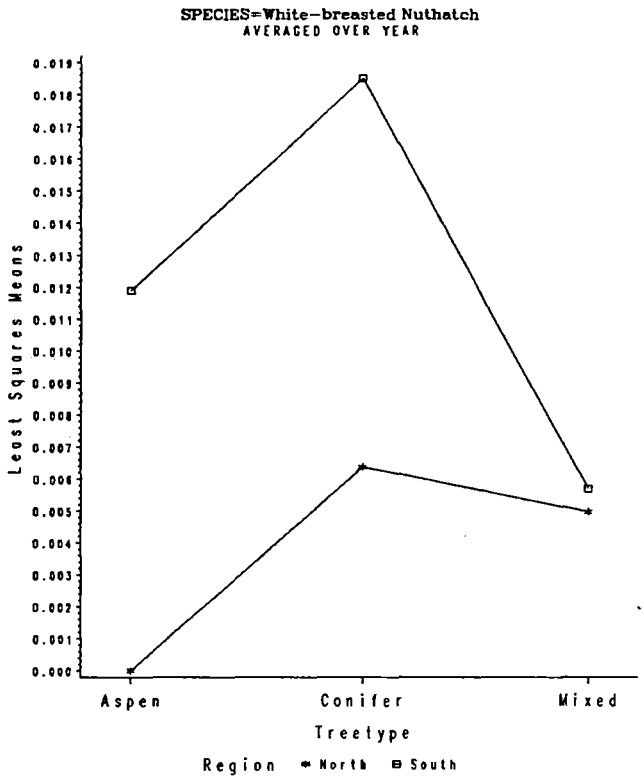
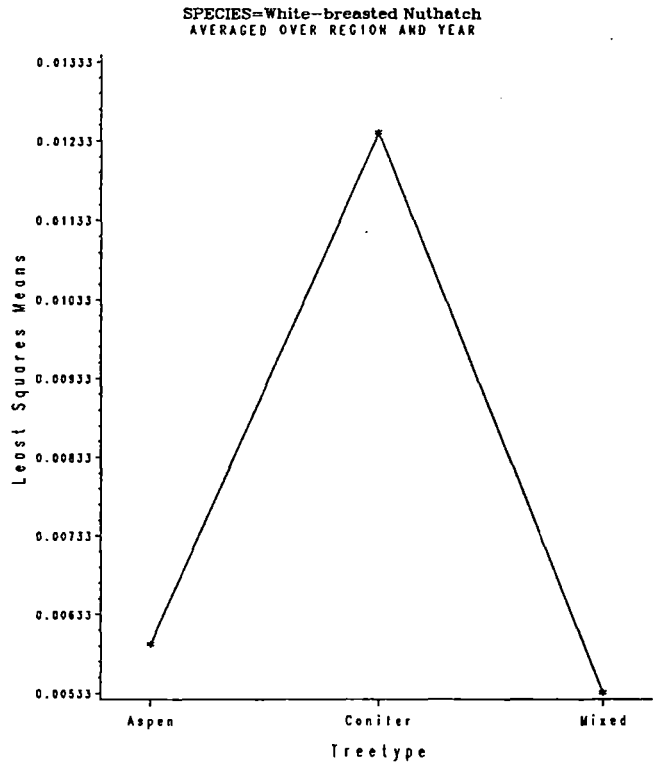


Fig. 44 (cont).


SPECIES=White-breasted Nuthatch
AVERAGED OVER YEAR
Least Squares Means
0.019
0.018
0.017
0.016
0.015
0.014
0.013
0.012
0.011
0.010
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.000
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=White-breasted Nuthatch
AVERAGED OVER REGION AND YEAR
Least Squares Means
0.01333
0.01233
0.01133
0.01033
0.00933
0.00833
0.00733
0.00633
0.00533
Aspen
Conifer
Mixed
Treetype

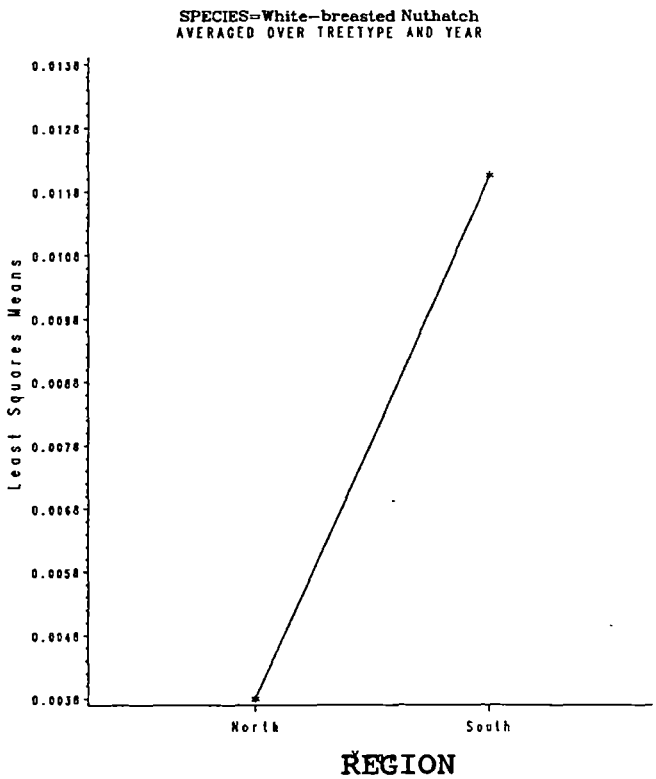
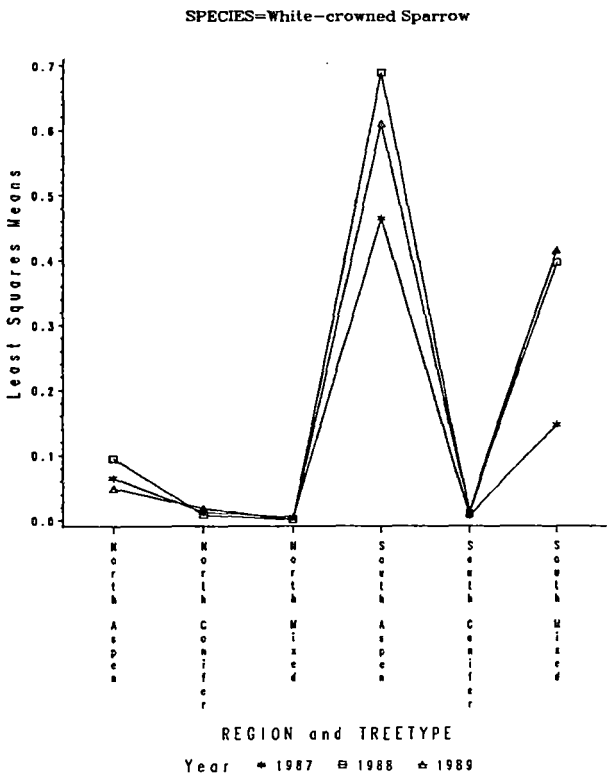
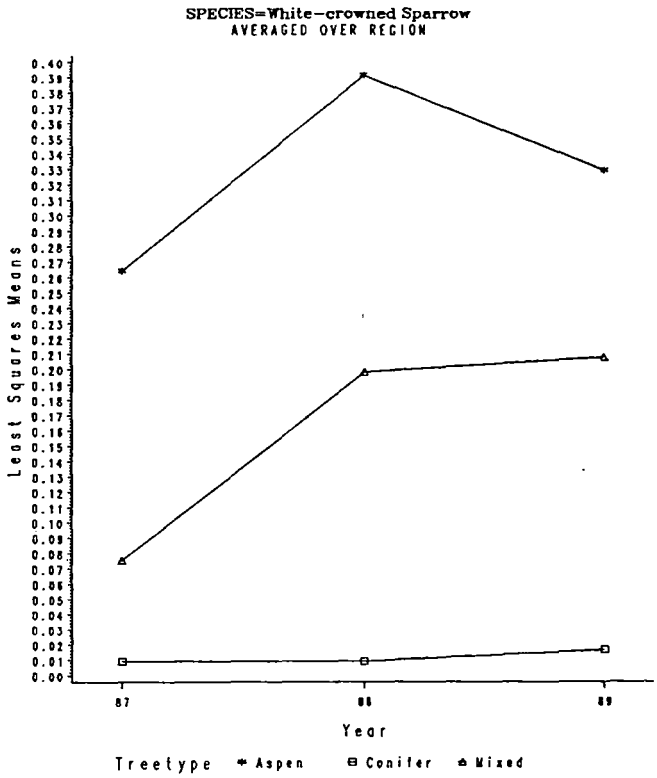
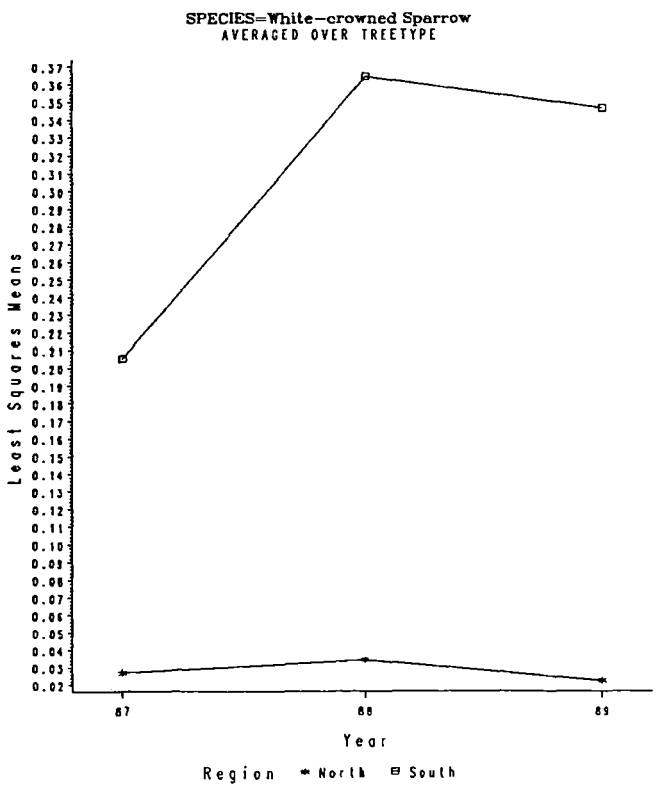
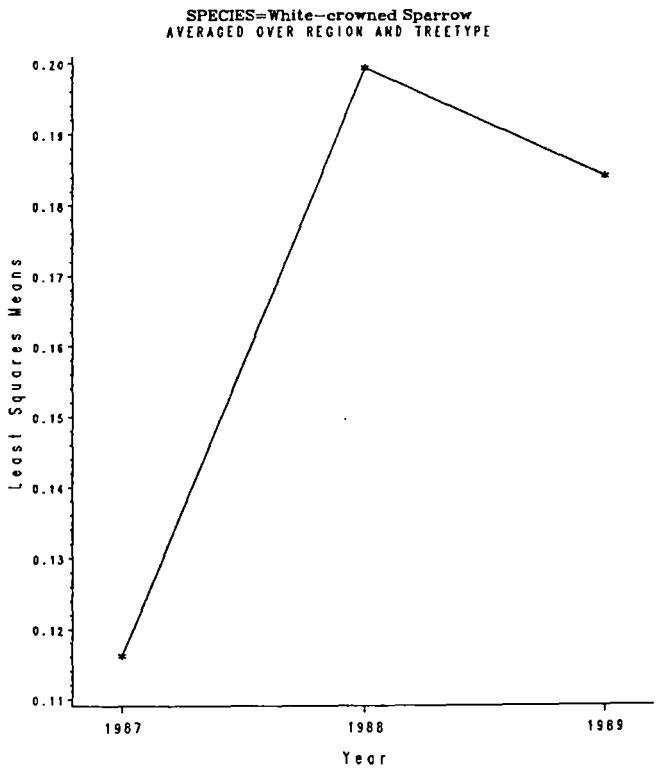

SPECIES=White-breasted Nuthatch
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
0.0138
0.0128
0.0118
0.0108
0.0098
0.0088
0.0078
0.0068
0.0058
0.0048
0.0038
North
South
REGION

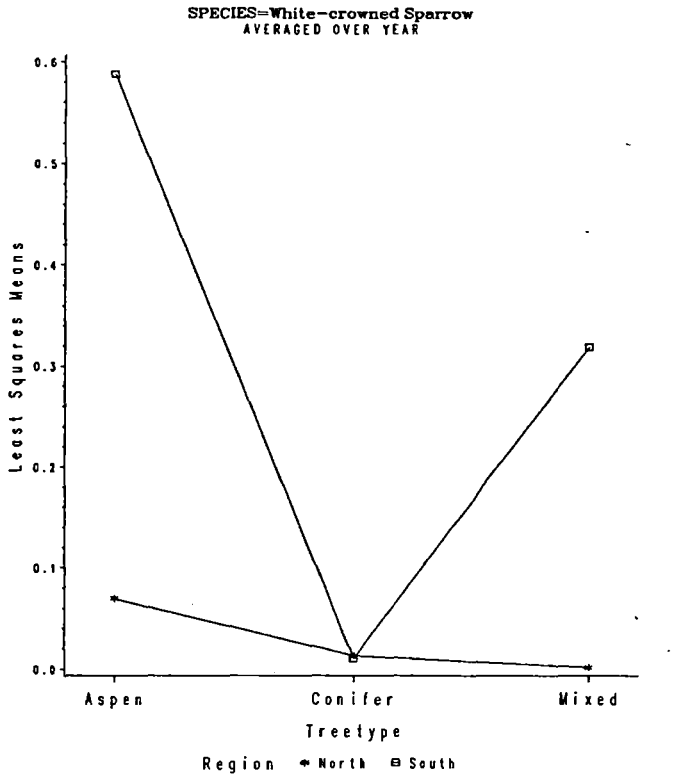
Fig. 45. Least squares means for White-crowned Sparrow in 6 habitats.

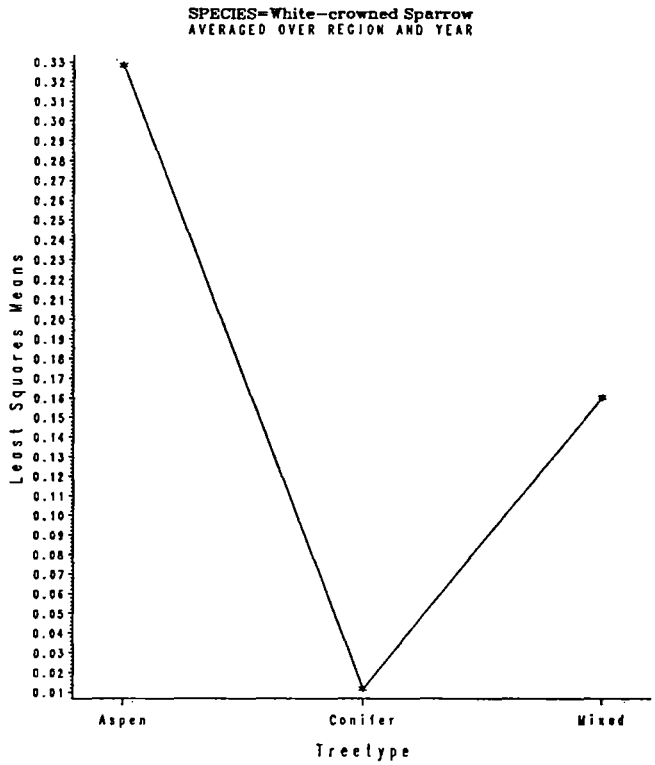









SPECIES=White-crowned Sparrow
AVERAGED OVER YEAR
Least Squares Means
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=White-crowned Sparrow
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

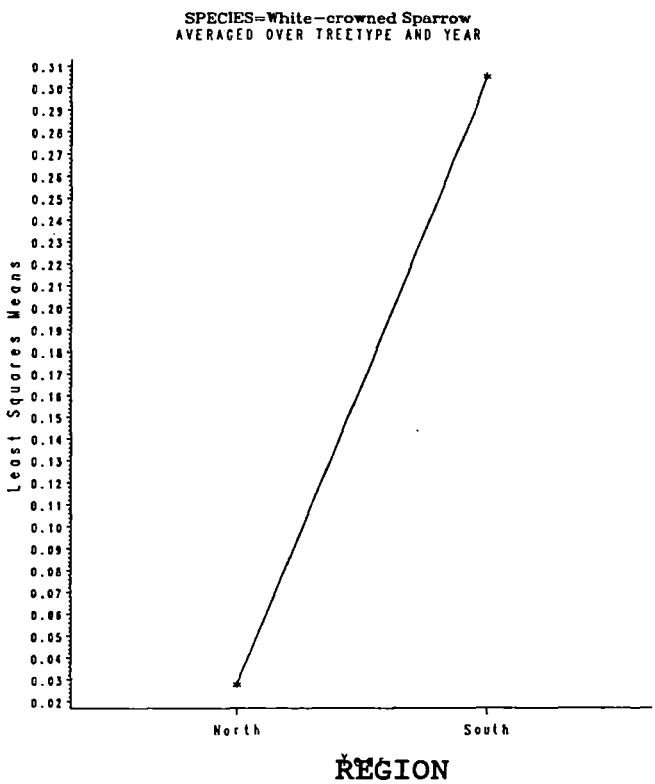
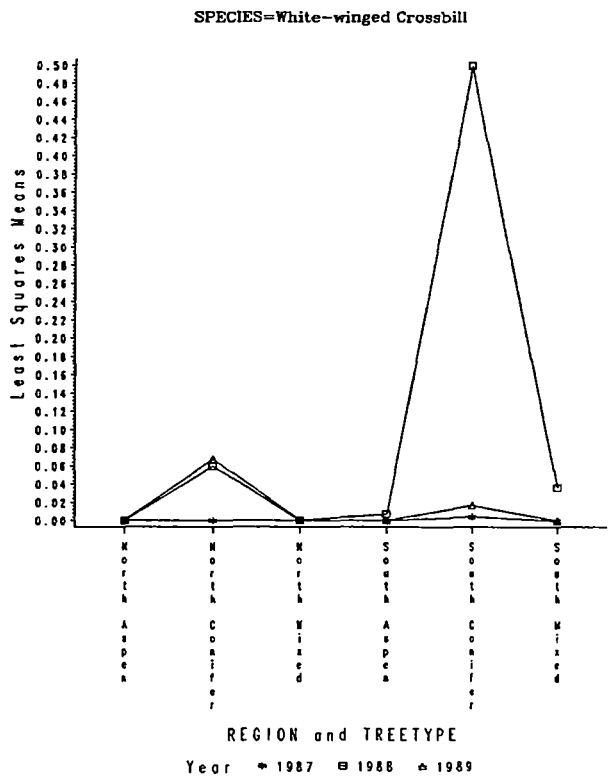
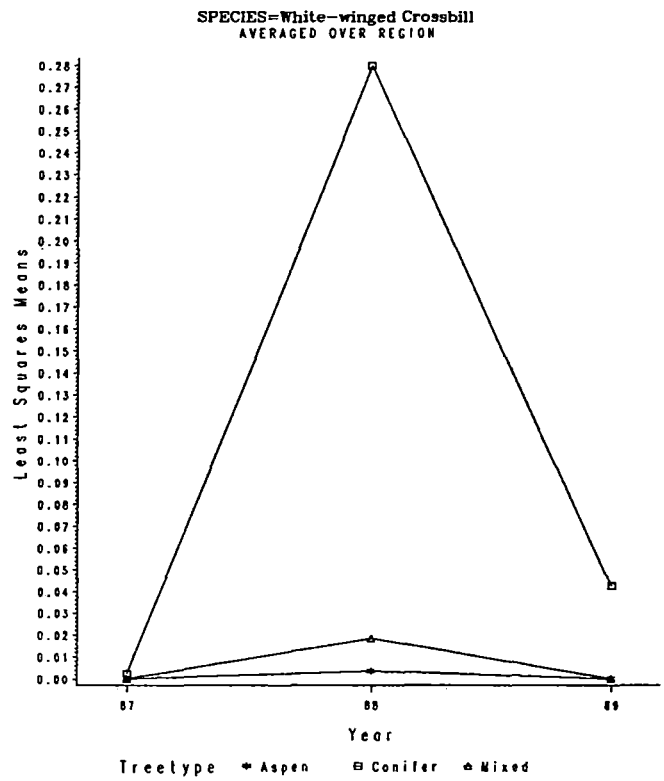
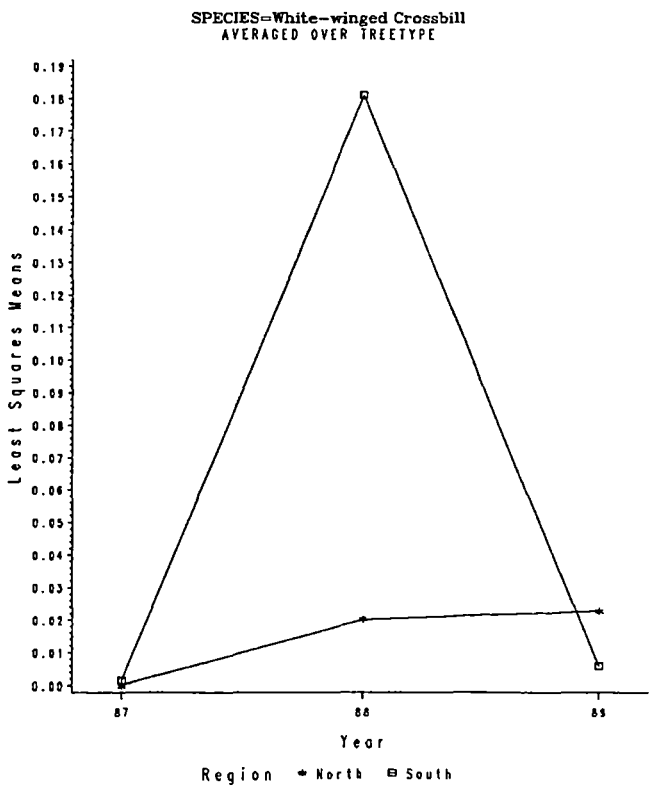

SPECIES=White-crowned Sparrow
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

Fig. 46. Least squares means for White-winged Crossbill in 6 habitats.







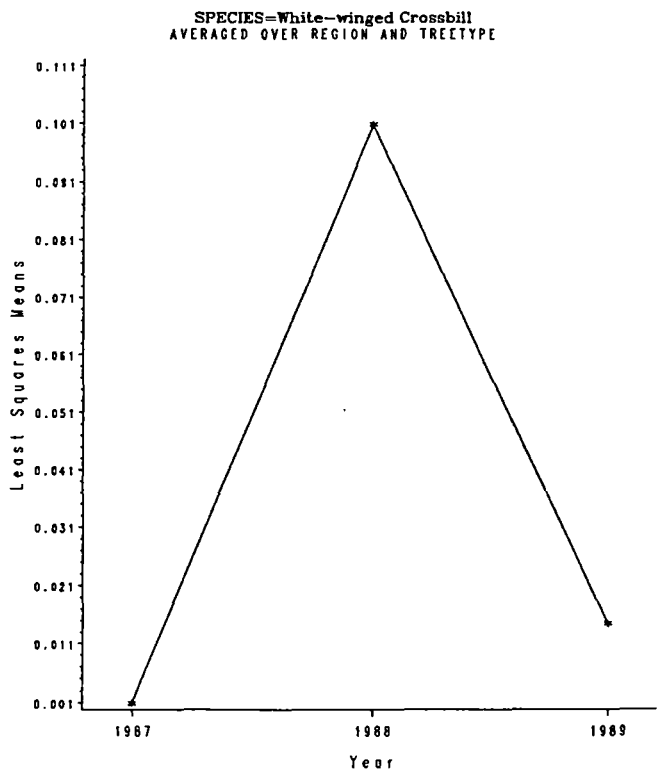
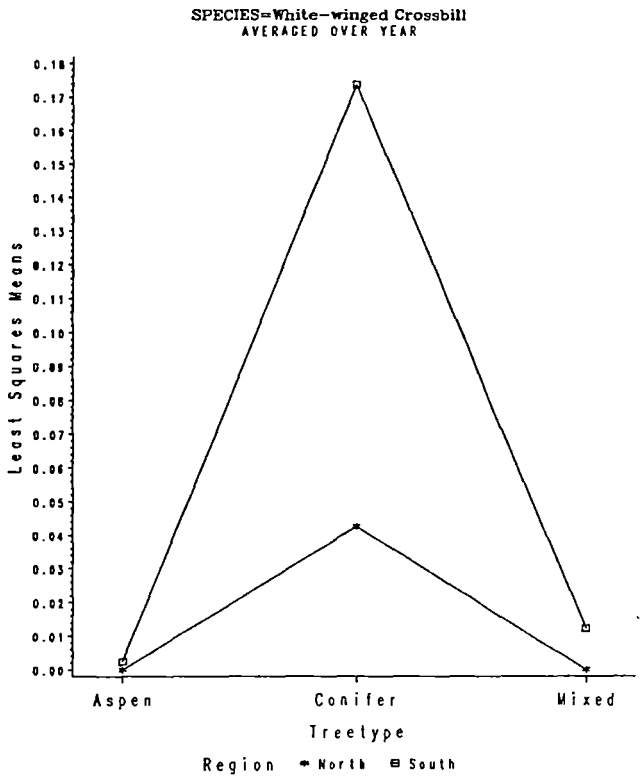
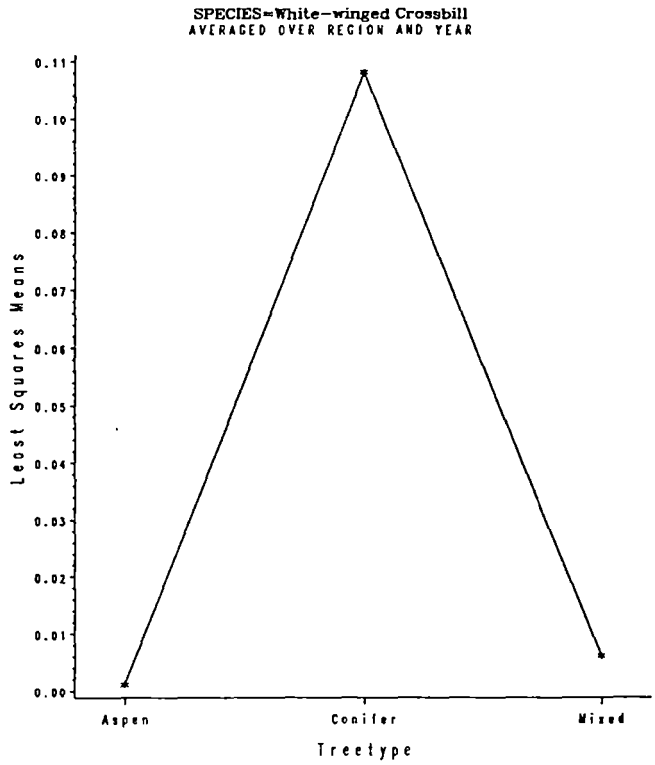


Fig. 46 (cont).


SPECIES=White-winged Crossbill
AVERAGED OVER YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=White-winged Crossbill
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

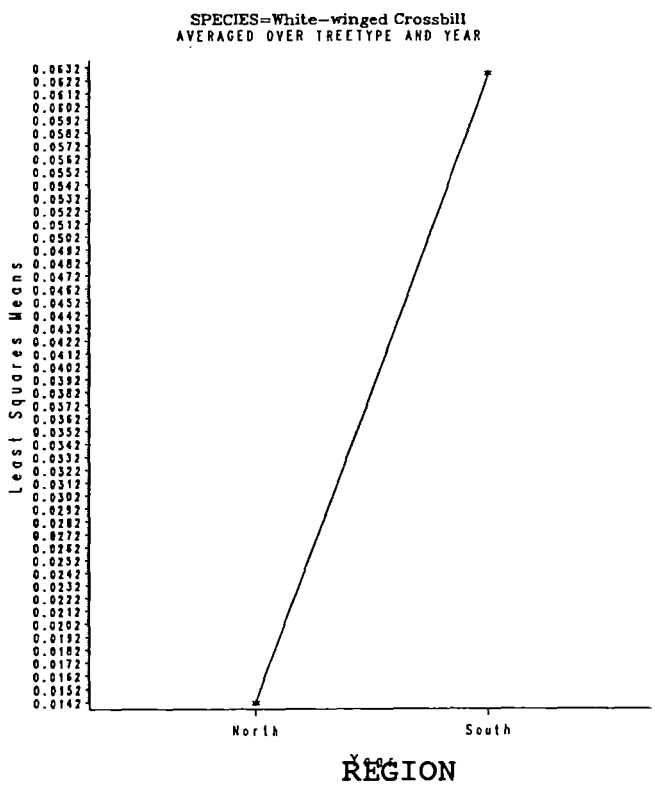
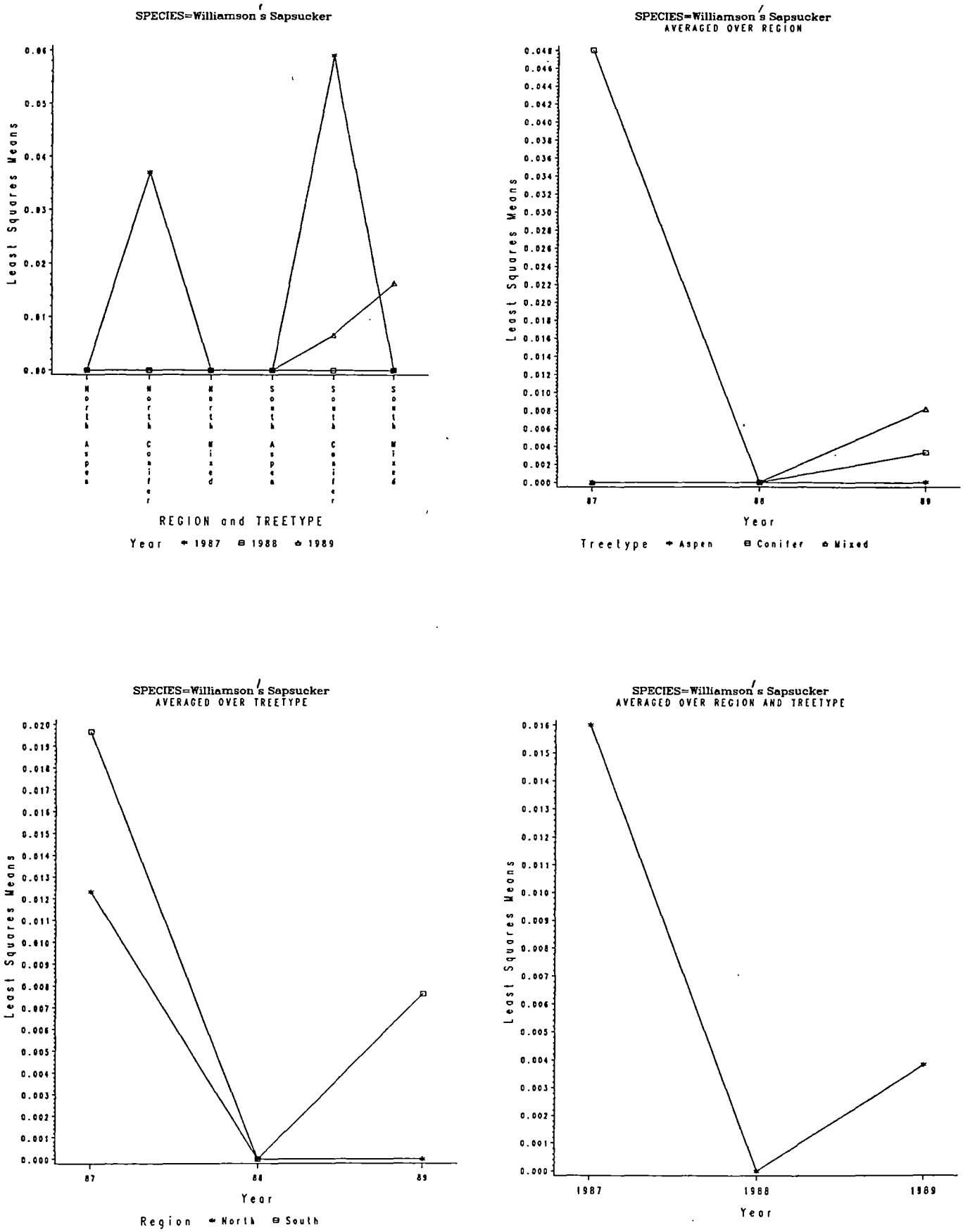
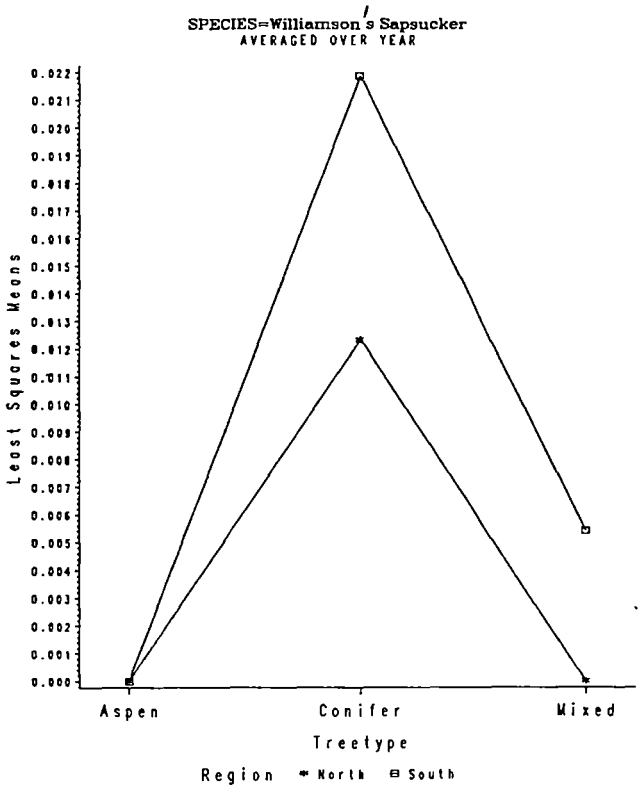
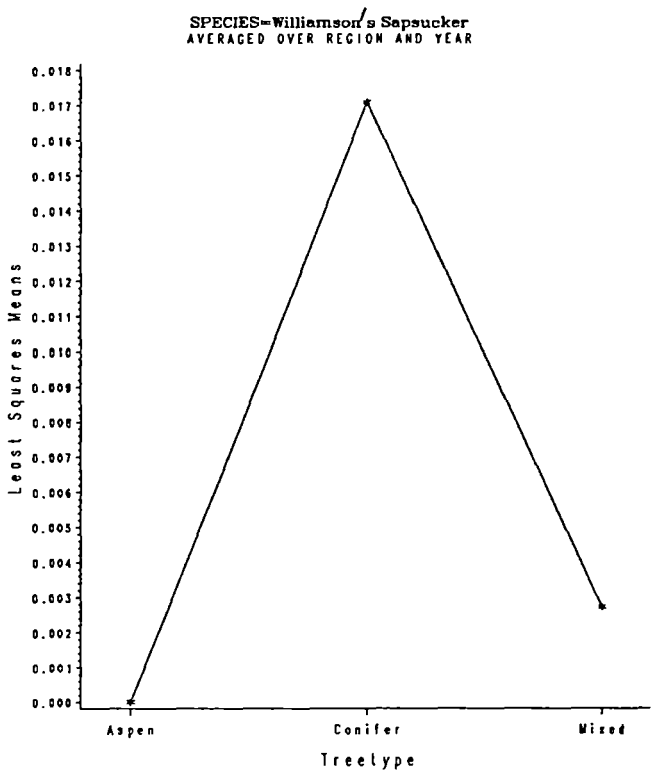

SPECIES=White-winged Crossbill
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

Fig. 47. Least squares means for Williamson's Sapsucker in 6 habitats.




SPECIES=Williamson's Sapsucker
AVERAGED OVER YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Williamson's Sapsucker
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

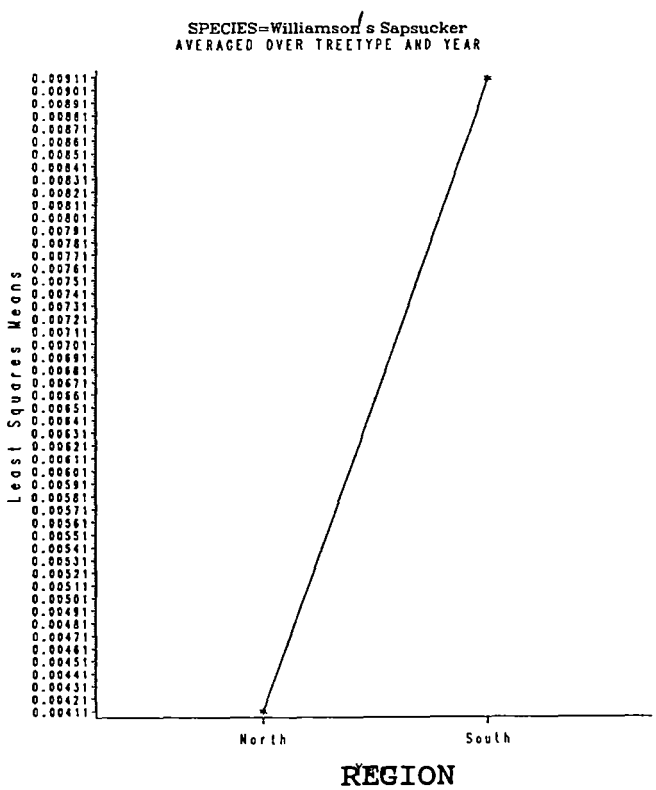
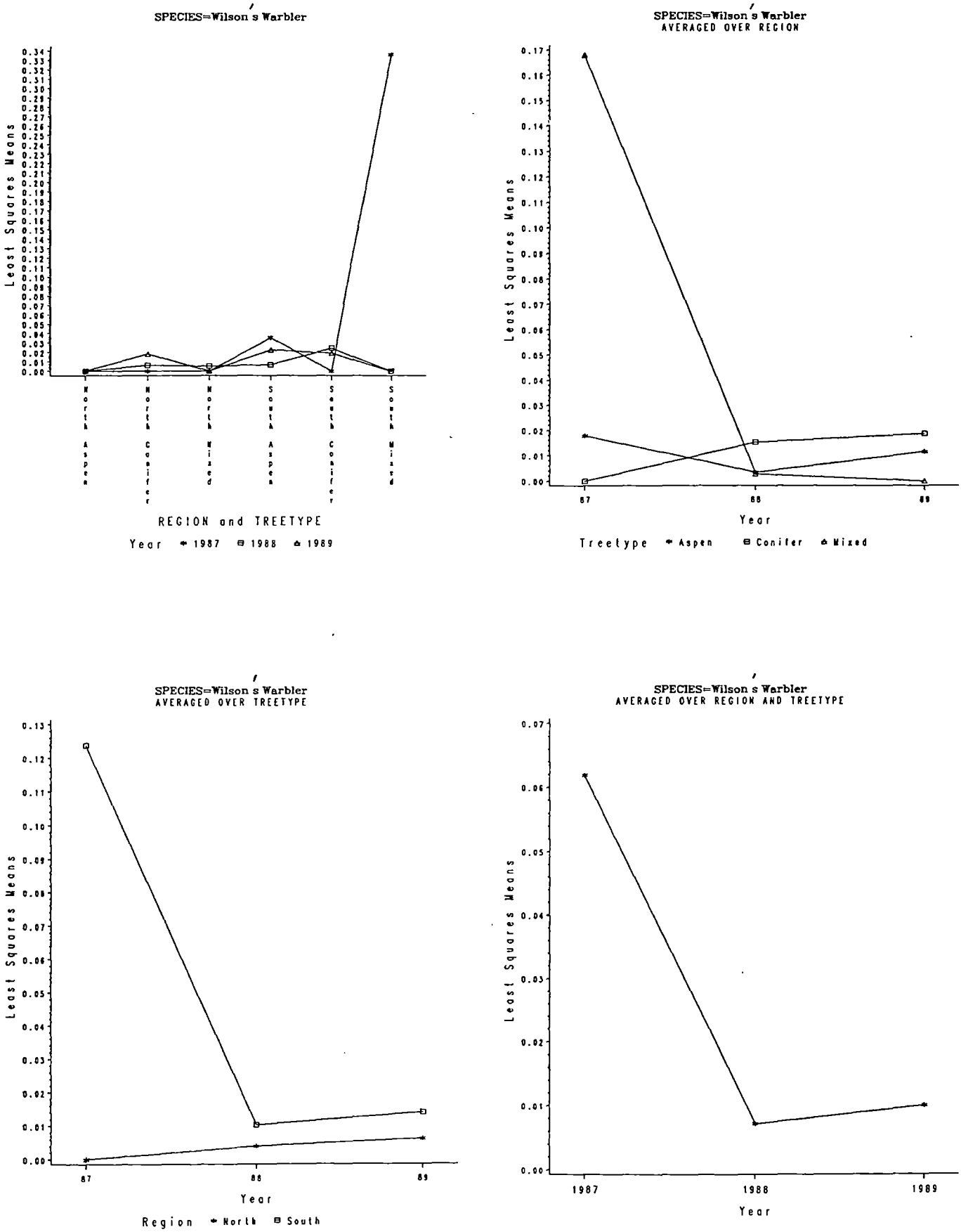
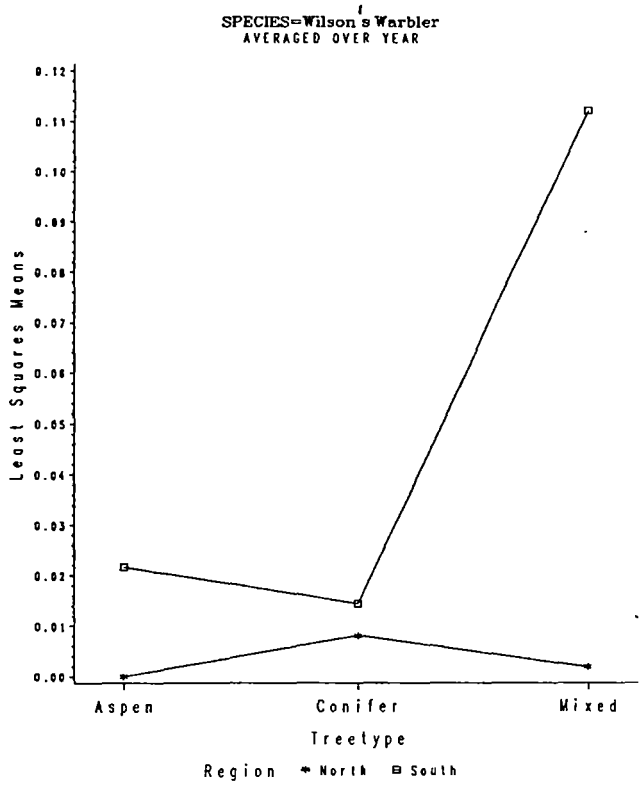
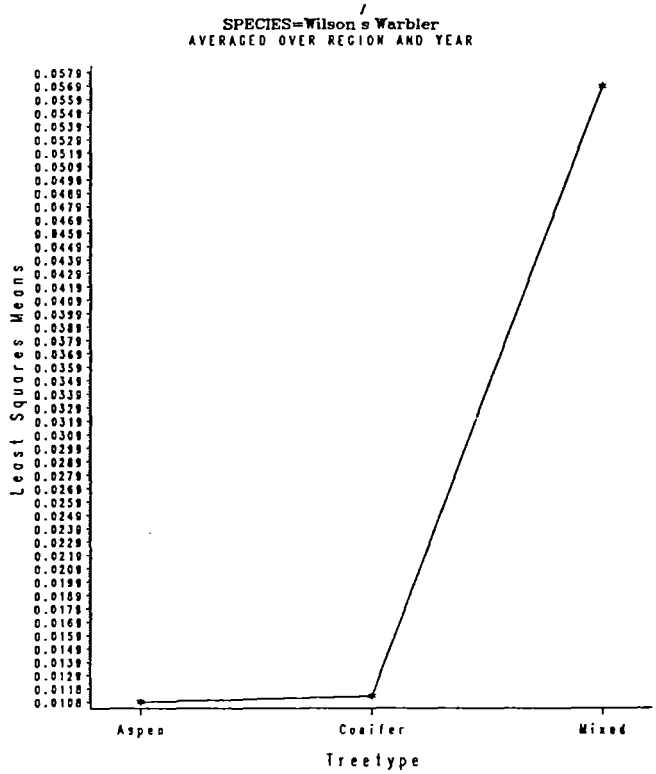

SPECIES=Williamson's Sapsucker
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

Fig. 48. Least squares means for Wilson's Warbler in 6 habitats.




SPECIES=Wilson's Warbler
AVERAGED OVER YEAR
Least Squares Means
0.12
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Aspen
Conifer
Mixed
Treetype
Region * North ⊟ South


SPECIES=Wilson's Warbler
AVERAGED OVER REGION AND YEAR
Least Squares Means
Aspen
Conifer
Mixed
Treetype

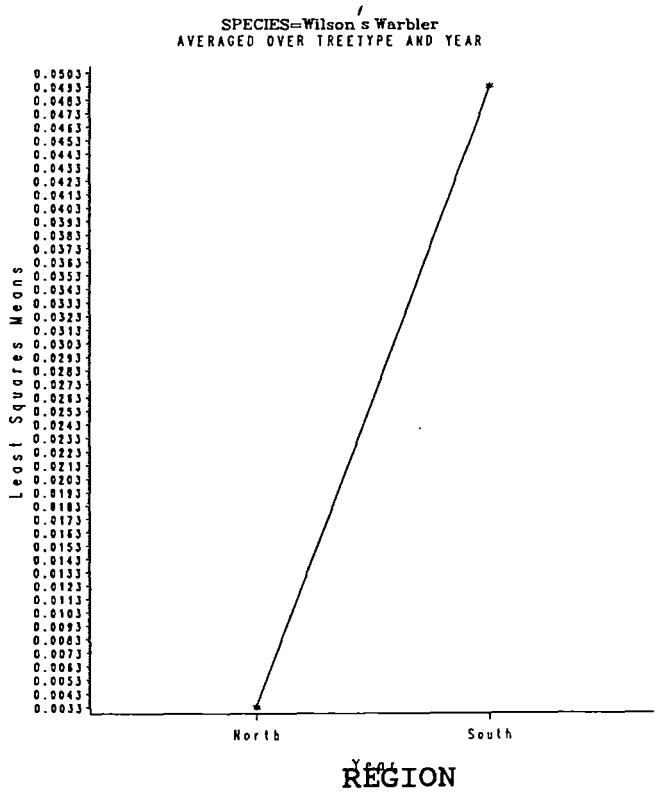
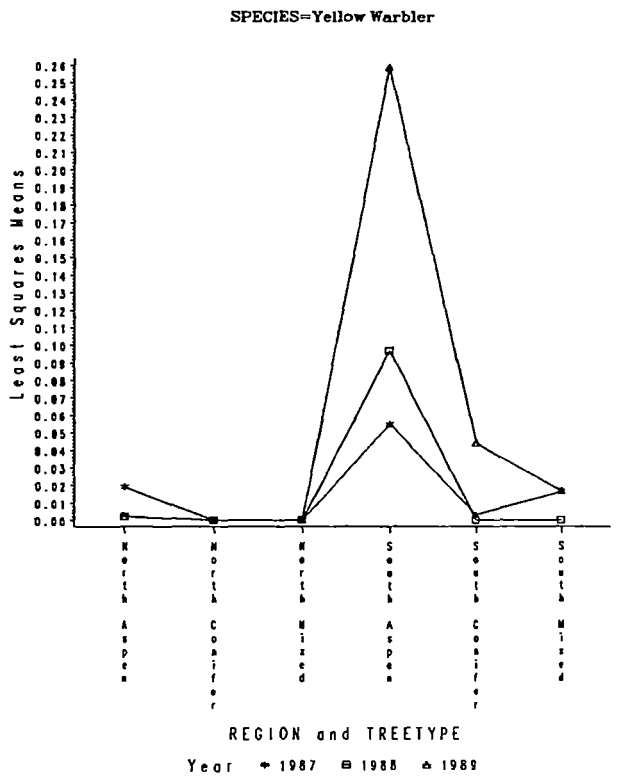
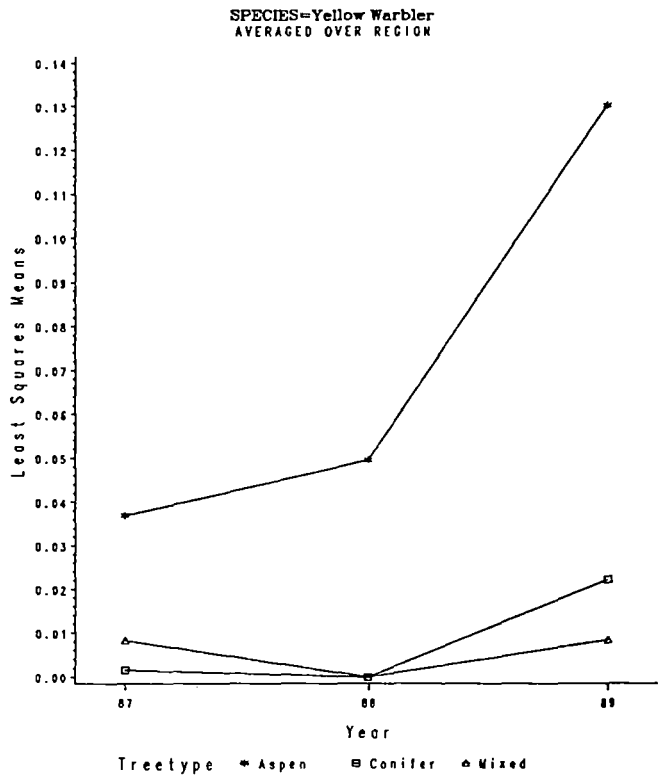
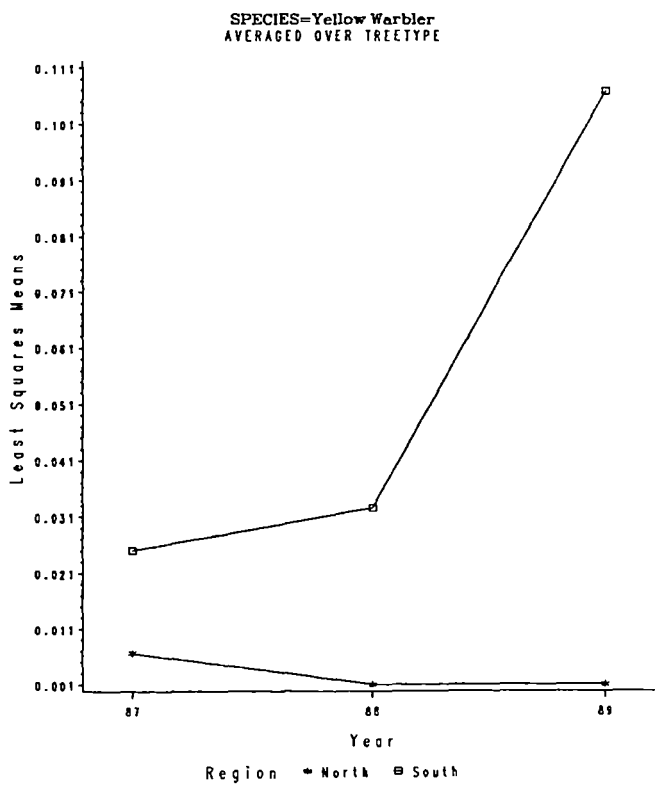
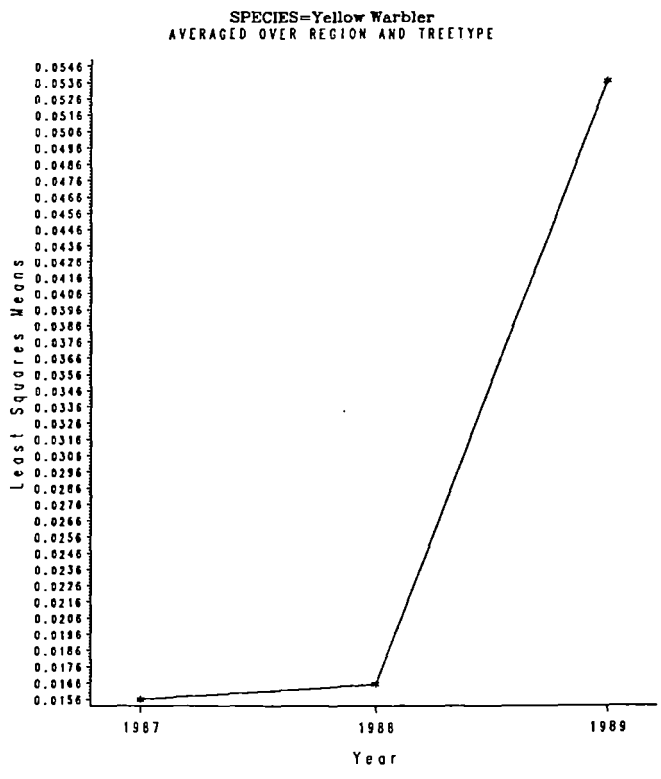

SPECIES=Wilson's Warbler
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
North
South
REGION

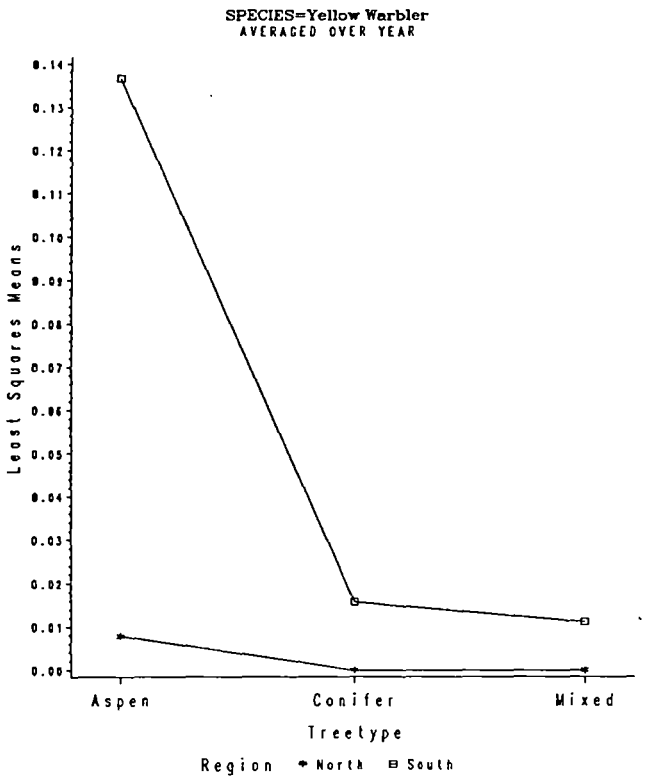
Fig. 49. Least squares means for Yellow Warbler in 6 habitats.

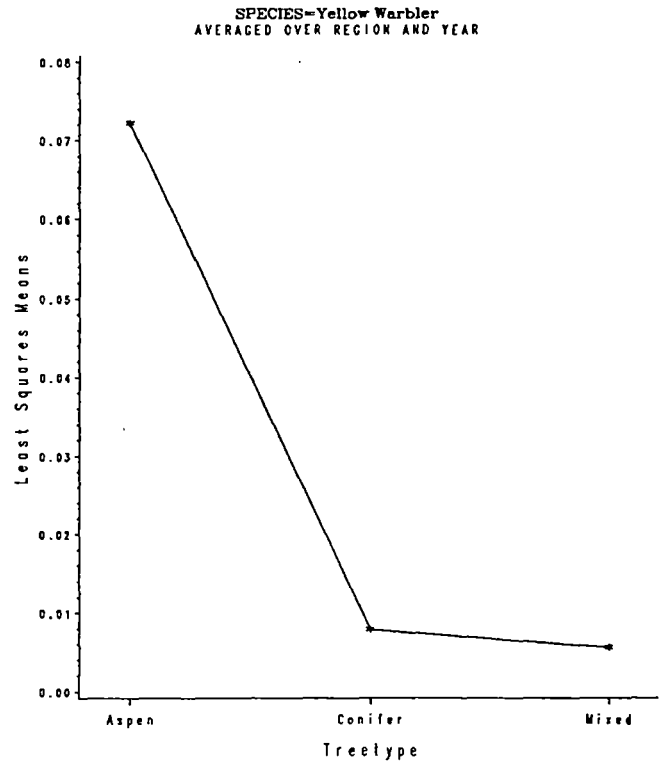









SPECIES=Yellow Warbler
AVERAGED OVER YEAR
Least Squares Means
0.14
0.13
0.12
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Aspen
Conifer
Mixed
Treetype
Region * North ⊟ South


SPECIES=Yellow Warbler
AVERAGED OVER REGION AND YEAR
Least Squares Means
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Aspen
Conifer
Mixed
Treetype

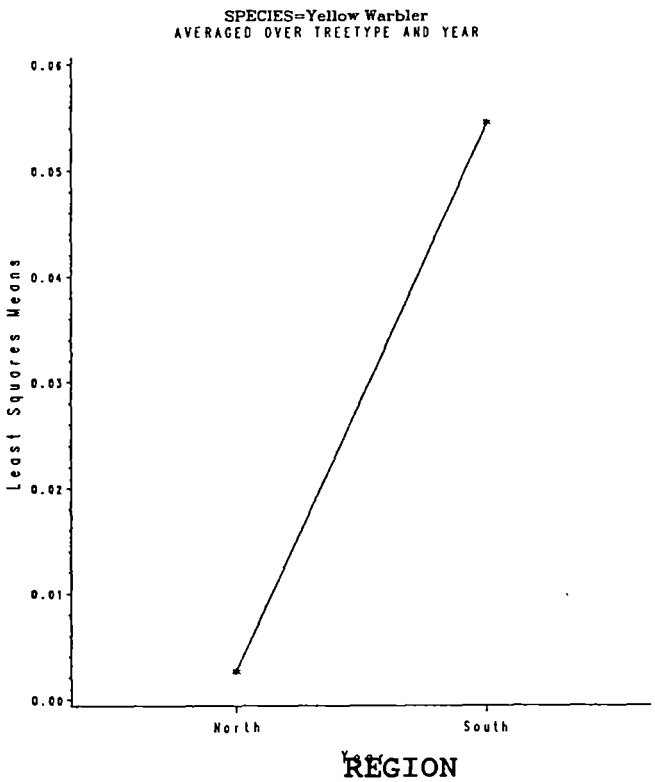
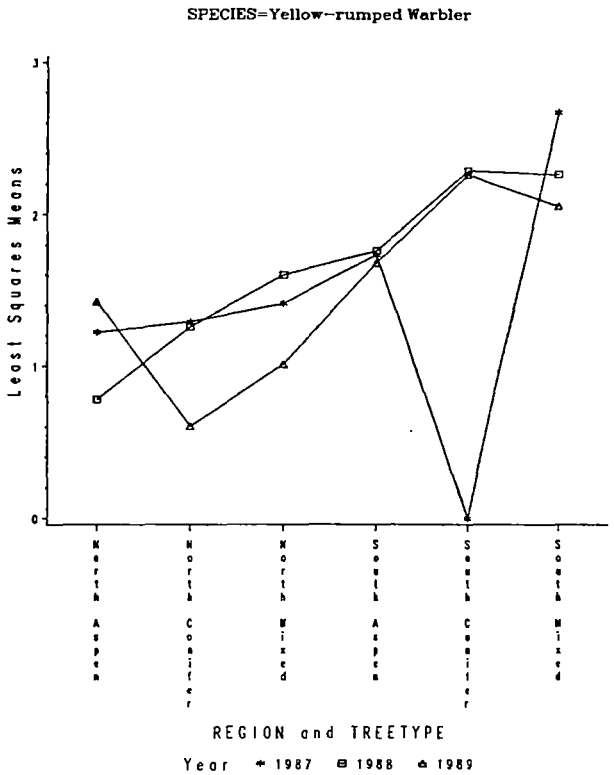
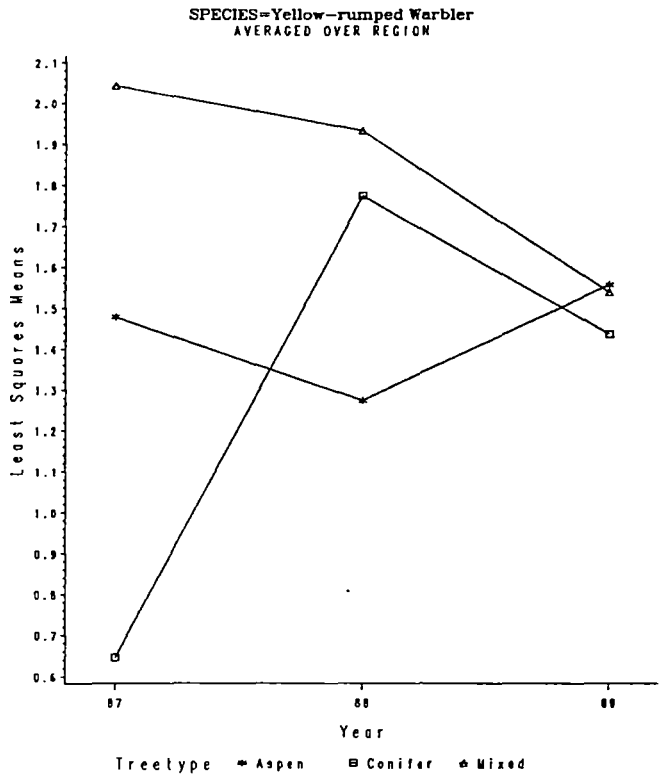
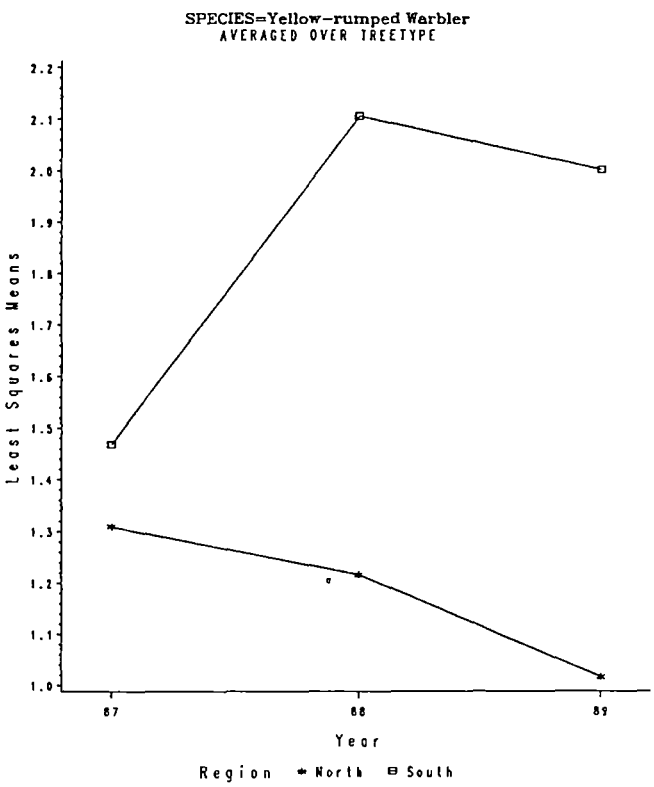

SPECIES=Yellow Warbler
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
0.06
0.05
0.04
0.03
0.02
0.01
0.00
North
South
REGION

Fig. 50. Least squares means for Yellow-rumped Warbler in 6 habitats.







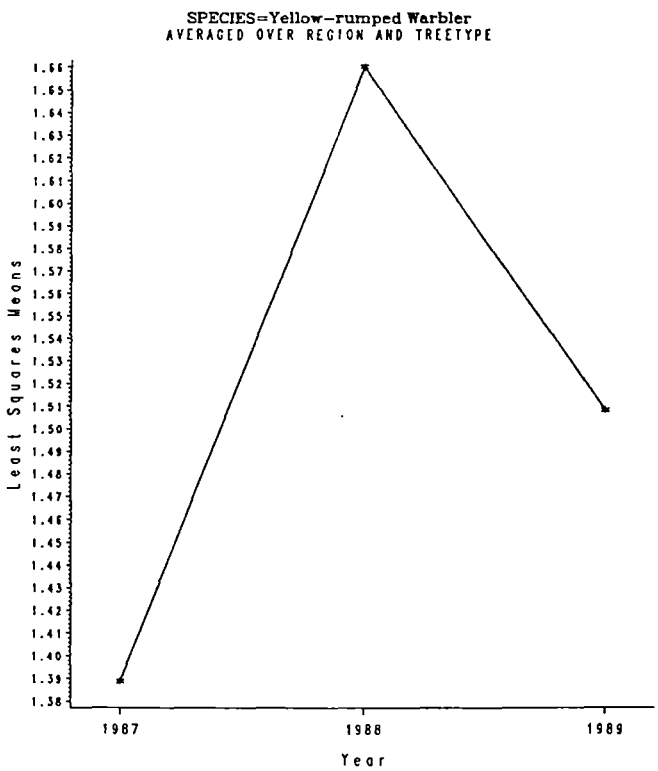
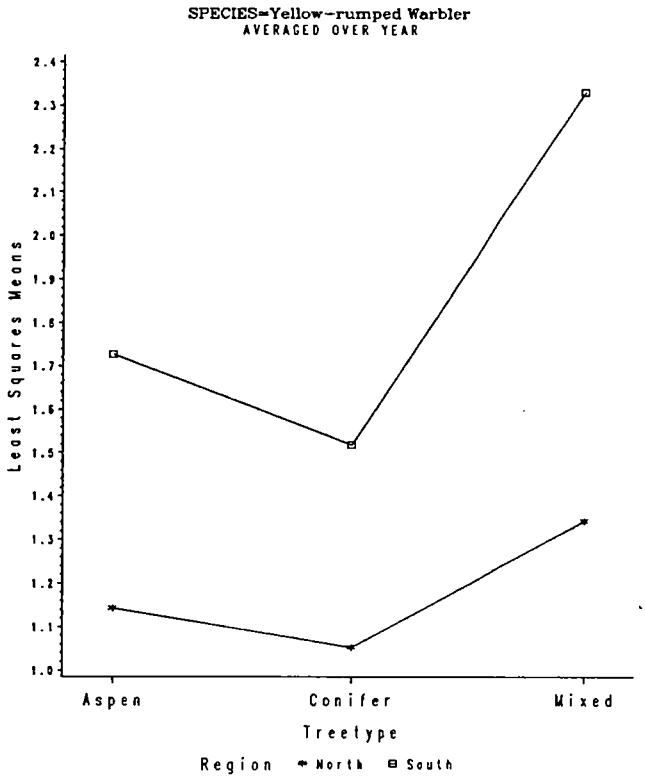
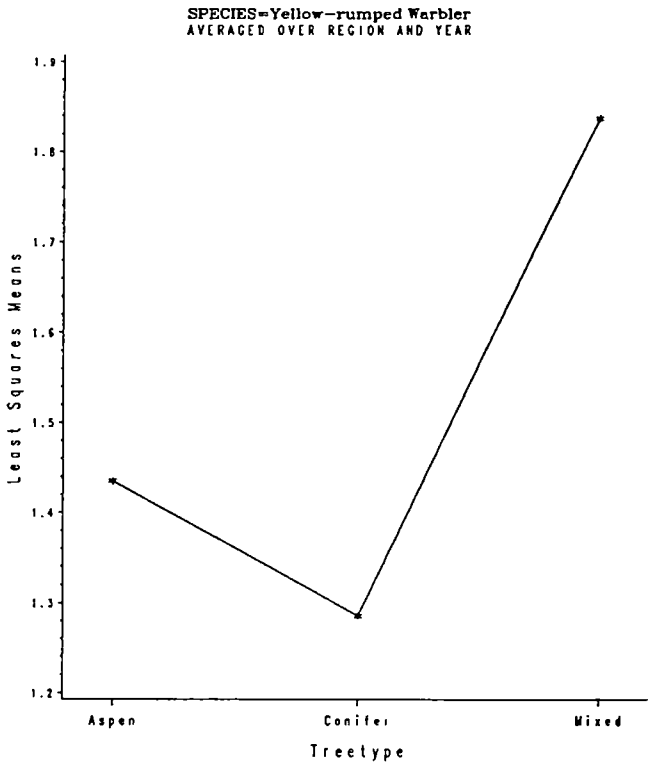


Fig. 50 (cont).


SPECIES=Yellow-rumped Warbler
AVERAGED OVER YEAR
Least Squares Means
2.4
2.3
2.2
2.1
2.0
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
Aspen
Conifer
Mixed
Treetype
Region North South


SPECIES=Yellow-rumped Warbler
AVERAGED OVER REGION AND YEAR
Least Squares Means
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
Aspen
Conifer
Mixed
Treetype

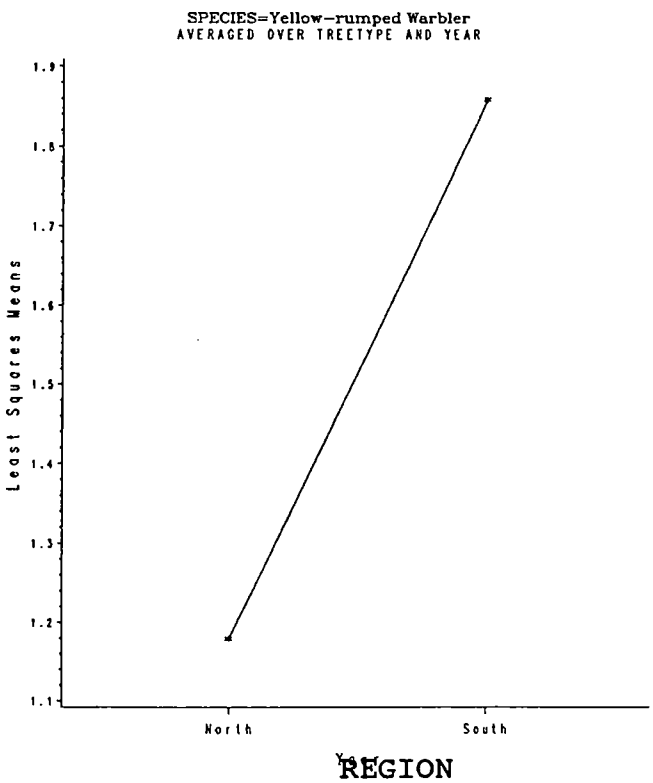

SPECIES=Yellow-rumped Warbler
AVERAGED OVER TREETYPE AND YEAR
Least Squares Means
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
North
South
REGION

Fig. 51. Dendogram of cluster analysis on bird estimated densities in the avian community response study in the Central Rocky Mountains, 1987-89.

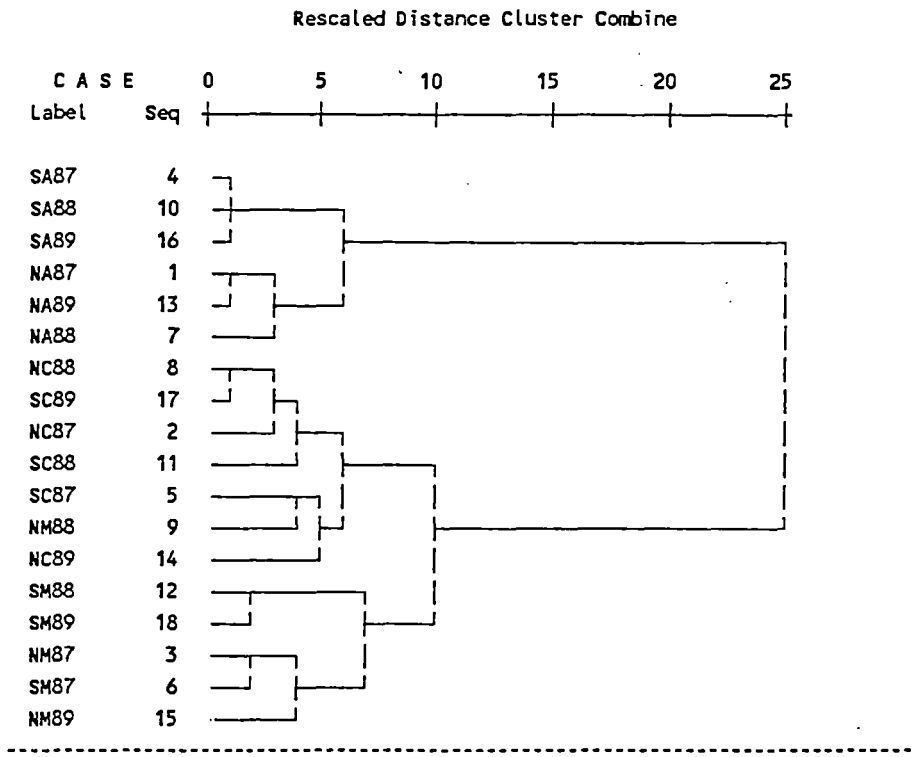


Fig. 52. Scree diagram from cluster analysis on bird estimated densities in the avian community response study in the Central Rocky Mountains, 1987-89.

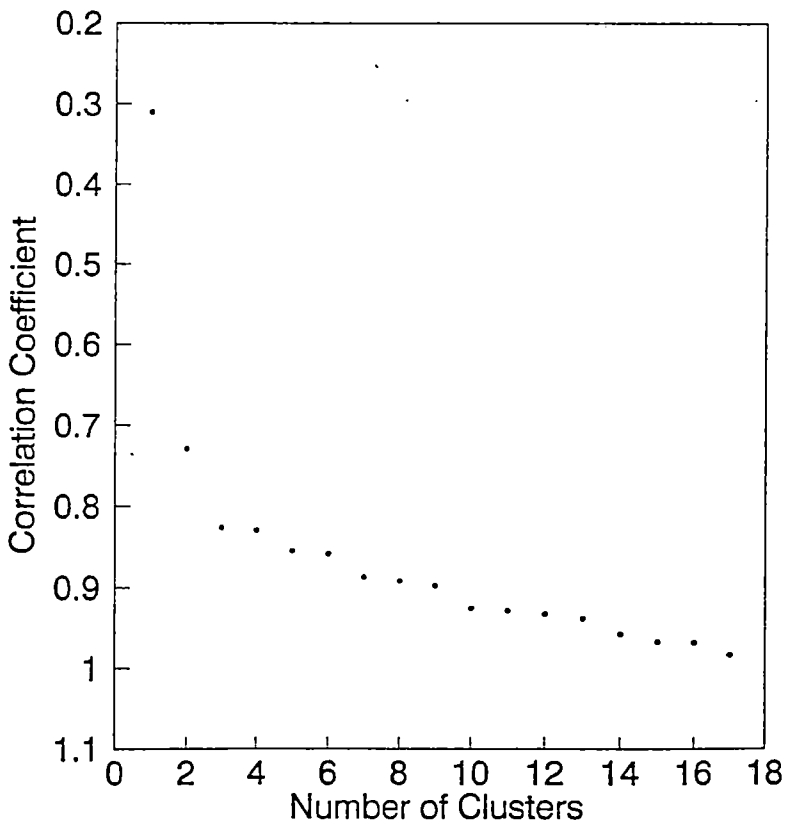
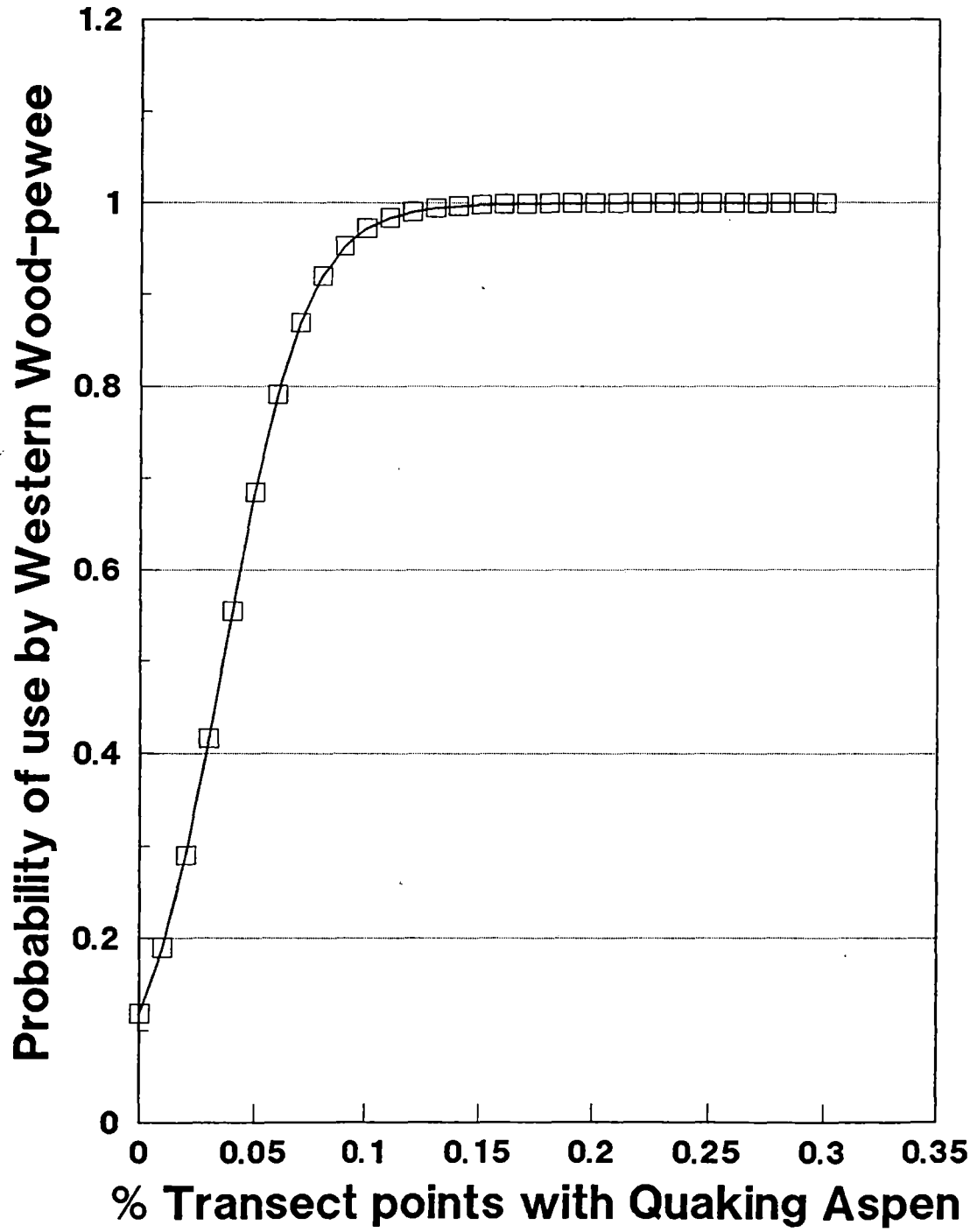


Fig. 53. Probability of use by Western Wood-pewee as a function of percent of transect points with Quaking Aspen (Populus tremuloides) present at 1.0-3.0m vertical distance in the avian community response to habitat study in the Central Rocky Mountains, 1987-89.



Appendix A. List of bird species observed during the avian response to habitat study in the Central Rocky Mountains, 1987-89.

CODE	Common Name
ALFL	Alder Flycatcher
AMCR	American Crow
AMRO	American Robin
BBMA	Black-billed Magpie
BCCH	Black-capped Chickadee
BCHU	Black-chinned Hummingbird
BGWA	Black-throated Gray Warbler
BHCO	Brown-headed Cowbird
BHGR	Black-headed Grosbeak
BLBW	Black-throated Warbler
BLSW	Black Swift
BRBL	Brewer's Blackbird
BRCR	Brown Creeper
BTHU	Broad-tailed Hummingbird
BTPI	Band-tailed Pigeon
BUGR	Blue Grouse
CAFI	Cassin's Finch
CHSP	Chipping Sparrow
CLNU	Clark's Nutcracker
COGR	Common Grosbeak
COHA	Cooper's Hawk
CONI	Common Nighthawk
CORA	Common Raven
COSN	Common Snipe
DEJU	Dark-eyed Junco
DOWO	Downy Woodpecker
DUFL	Dusky Flycatcher
EMPI	Empidomax Species
EUST	European Starling
EVGR	Evening Grosbeak
FOSP	Fox's Sparrow
GCKI	Golden-crowned Kinglet
GHOW	Great Horned Owl
GOEA	Golden Eagle
GOSH	Goshawk
GRCA	Gray Catbird
GRJA	Gray Jay
GTTO	Green-tailed Towhee
HAFL	Hammond's Flycatcher
HAWO	Hairy Woodpecker
HETH	Hermit Thrush
HOFI	House Finch
HOSP	House Sparrow
HOWR	House Wren
LABU	Lazuli Bunting

Appendix A. List of bird species observed during the avian response to habitat study in the Central Rocky Mountains, 1987-89.

CODE	Common Name
LEFL	Least Flycatcher
LISP	Lincoln's Sparrow
MALL	Mallard
MAWA	Magnolia Warbler
MGWA	MacGillivray's Warbler
MOBL	Mountain Bluebird
MOCH	Mountain Chickadee
MODO	Mourning Dove
NOFL	Northern Flicker
NOGO	Northern Goshawk
NPOW	Northern Pygmy Owl
OCWA	Orange-crowned Warbler
OSFL	Olive-sided Flycatcher
PIGR	Pine Grosbeak
PISI	Pine Siskin
PIWA	Pine Warbler
PUMA	Purple Martin
RBNU	Red-breasted Nuthatch
RCKI	Ruby-crowned Kinglet
RECR	Red Crossbill
REVI	Red-eyed Vireo
RNSA	Red-naped Sapsucker
RSTO	Red-sided Towhee
RTHA	Red-tailed Hawk
RUHU	Rufous Hummingbird
RWBL	Red-winged Blackbird
RWSW	Rough-winged Swallow
SORO	Sora Rail
SOSP	Song Sparrow
SOVI	Solitary Vireo
SSHA	Sharp-shinned Hawk
STJA	Steller's Jay
SWHA	Swainson's Hawk
SWTH	Swainson's Thrush
TOSO	Townsend's Solitaire
TOWA	Townsend'S Warbler
TRSW	Tree Swallow
TTWO	Three-toed Woodpecker
TUVU	Turkey Vulture
UNFL	Unknown Flycatcher
VEER	Veery
VESP	Vesper Sparrow
VGSW	Violet-green Swallow
WAVI	Warbling Vireo
WBNU	White-breasted Nuthatch

Appendix A. List of bird species observed during the avian response to habitat study in the Central Rocky Mountains, 1987-89.

CODE	Common Name
WCSP	White-crowned Sparrow
WEFL	Western Flycatcher
WEME	Western Meadowlark
WETA	Western Tanaager
WIFL	Willow Flycatcher
WISA	Williamson's Sapsucker
WIWA	Wilson's Warbler
WTSW	White-throated Swift
WWCR	White-winged Crossbill
WWPE	Western Wood-pewee
YEWA	Yellow Warbler
YRWA	Yellow-rumped Warbler

Appendix B. List of non-bird species observed during the avian response to habitat study in the Central Rocky Mountains, 1987-89.

CODE	NAME
BOTA	Domestic cow
CALA	Coyote
LEAM	Snowshoe hare
MAAM	Pine marten
MAFL	Yellow-bellied marmot
MUER	Short-tailed weasel
OCPR	Pica
OVAR	Domestic sheep
PSTR	Boreal chorus frog
SPLA	Golden-mantled squirrel
THTA	Pocket gopher
TISW	Tiger swallowtail butterfly
URAM	Black bear
VUFU	Red fox

Appendix C. List of vegetation species observed with acronymns in the avian response to habitat study in the Central Rocky Mountains, 1987-89.

ABLA Abies lasiocarpa
ACCO Aconitum columbianum
ACGL Acer glabrum
ACHI Achillea
ACLA Achillea lanulosa
ACON Aconitum
ACRU Actaea rubra
ACST Agrostis stolonifera
AGAU Agoseris aurantiaca
AGFO Agastache foeniculum
AGGL Agoseris glauca
AGOS Agoseris
AGRO Agropyron
AGSC Agrostis scabra
AGSP Agropyron spicatum
AGST Agrostis stolonifera
AGUR Agastache urtififolia
ALAE Alopecurus aequalis
ALOP Alopecurus
ALTE Alnus tenufolia
AMAL Amelanchier alnifolia
ANEM Anemone
ANMA Anaphalis margaritacea
ANRO Antennaria rosea
ANTE Antennaria
AQCA Aquilegia caerula
AQCO Aquilegia coerula
AQUI Aquilegia
ARAB Arabis
ARCA Artemesia cana
ARCO Arnica cordifolia OR Arenaria congesta
AREN Arenaria
ARLA Arnica latifolia
ARLU Artemesia ludoviciana
ARNI Arnica
ARPA Arnica parryi
ARUU Arctostaphylos uva
ARUV Arctostaphylos uva
ASEN Aster engelmannii
ASMI Astragulus miser
ASTE Aster
ASTR Astragulus
BASA Balsamorrhiza sagittata
BRAN Bromopsis anomalis
BRIN Bromopsis inermis
BROM Bromopsis
BROS Bromopsis

Appendix C. List of vegetation species observed with acronyms in the avian community response to habitat study in Central Rocky Mountains, 1987-89.

CABU Calypso bulbosa
CACO Cardamine cordifolia
CAGE Carex geyeri
CAGU Calochorus gunnisonii
CAHO Carex hoodii
CALA Calamagrostis
CALE Caltha leptosepala
CALT Caltha
CAMI Carex microptera OR Castilleja miniata
CAMP Campanula
CARD Cardamine
CARE Carex
CARU Calamagrostis rubescens
CAST Castilleja
CASU Castilleja sulphurea
CEAR Cerastium arvense
CHAN Chamerion angustifolium
CHEN Chenopodium
CHNA Chrysothamnus nauseosus
CHPA Chrysothamnus parryi
CHRY Chrysothamnus
CHSU Chamomilla suaveoleus
CIRS Circium
CLCO Clematis columbiana
CLEM Clematis
COAU Corydalis aurea
COCA Corydalis caesna
COLI Collomia linearis
DACA Danthonia califonia
DAGL Dactylis glomerata
DANT Danthonia
DEBA Delphinium barbeyi
DELP Delphinium
DENU Delphinium nuttallianum
DEOC Delphinium occidentale
DERA Delphinium ramosum
DERI Descurainia richardsonii
DESC Descurainia
DISP Disporium
DRPA Dracocephalum parviflorum
DUHO Dugaldia hoopesii
ELCA Elymus canadensis
ELYM Elymus
EPIL Epilobium
EQUI Equisetum
EREL Erigeron elatior
ERFL Erigeron flagellaris

Appendix C. List of vegetation species observed with acronyms in the avian community response to habitat study in the Central Rocky Mountains, 1987-89.

ERGR Erythronium grandiflorum
ERIG Erigeron
ERPE Erigeron peregrinus
ERSP Erigeron speciosus
ERSU Erigeron subtrinervis
ERYT Erythronium
FEID Festuca idahoensis
FESC Festuca
FEST Festuca
FRAG Frageria
FRAM Frageria americana
FRAS Frasera
FROV Frageria ovalis
FRSP Frasera speciosa
FRVI Frageria virginiana
GAAP Galium aparine
GABO Galium boreale
GALI Galium
GASE Galium septentrionale
GATR Galium triflorum
GEAM Gentianella amarella
GERA Geranium
GERI Geranium richardsonii
GEVI Geranium viscosissiumum
GLYC Glyceria
GOOB Goodyeres oblongifoliss
GOOD Goodyerss
HELI Helianthus
HEMU Heliomeris multiflora
HEQU Helianthella quinquenervis
HESP Hesperis
HIER Hieracium
HORD Hordeum
HYFE Hydrophyllum fendleri
JUCO Juniperis communis OR Juncus confusus
JUEN Juncus ensifolius
JUNC Juncus
LALE Lathyrus leucanthus
LANE Lathyrus nevadensis
LATH Lathyrus
LICH Listera chordata
LIFI Ligusticum filicinum
LILE Linum lewisii
LIPO Ligusticum porteri
LOIN Lonicera involucrata
LOLI Lolium
LUAR Lupinus argenteus

Appendix C. List of vegetation species observed with acronyms in the avian community response to habitat study in the Central Rocky Mountains, 1987-89.

LUPI Lupinus
MADI Madia
MARE Mahonia repens
MEAL Mertensia alpina
MECI Mertensia ciliata
MELI Melica
MERT Mertensia
MESP Melica spectabilis
MEVI Mertensia viridis
MIMU Mimulus
MINT
MIPE Mitella pentandra
MITE Mitella
MOSS
ORLU Orthocarpus luteus
OSDE Osmorhiza depauperata
OSMO Osmorhiza
OSOC Osmorhiza occidentalis
OXYT Oxytropis
PACH Pachistima
PEBR Pedicularis bracteosa
PEDI Pedicularis
PEGA Perideridia gairdneri
PEGR Pedicularis groenlandica
PENS Penstemon
PEPR Pedicularis procera
PERA Peraphyllum ramosissimum OR Pedicularis racemosa
PHAL Phleum alpinum
PHLE Phleum
PHLO Phlox
PICO Pinus contorta
PIEN Picea engelmannii
PIPU Picea pungens
PLAN Plantago
POAS Poa
POCO Poa compressa
POGR Potentilla gracilis
POLE Poa leptocoma
POLY Polygonum
PONE Poa nervosa OR Poa nevadensis
POTE Potentilla
POTR Populus tremuloides
PRVI Prunus virginiana
PSJA Pseudostellaria jamesiana
PTAQ Pteridium aqulinum
PYAS Pyrola asarifolia
PYRO Pyrola

Appendix C. List of vegetation species observed with acronyms in the avian community response to habitat study in the Central Rocky Mountains, 1987-89.

QUGA Quercus gambellii
RANA Ranunculus
RANU Ranunculus
RIAR Ribes arvense
RIBE Ribes
RICE Ribes cereum
RIIN Ribes inerme
RIMO Ribes montigenum
ROWO Rosa woodsii
RUDB Rudbeckia
RUDE Rumex densiflorus
RUID Rubus idaeus
RUOC Rudbeckia occidentalis
RUPA Rubus parviflora
SAAM Salix amygaloides
SALI Salix
SAMB Sambucus
SARA Sambucus racemosa
SASC Salix scouleriana
SAXI Saxifraga
SECR Senecio crassulus
SEER Senecio eremophilus
SENE Senecio
SETR Senecio triangularis
SICA Sidalcea candida
SIDA Sidalcea
SMIL Smilacina
SMRA Smilacina racemosa
SMST Smilacina stellate
SOLI Solidago
SOSC Sorbus scopulina
SOSP Solidago spathulata
STAM Streptopus amplexifolius
STEL Stellaria
STIP Stipa
STJA Stellaria jamesiana
STRE Streptopus
SYMP Symphoricarpos
SYOR Symphoricarpos oreophilus
TAOF Taraxacum officinale
TERA Teraxacum
THAL Thalictrum
THER Thermopsis
THFE Thaspi fendleri OR Thalictrum fendleri
THLA Thlaspi
THMO Thermopsis montana
TRAG Tragopogon

Appendix C. List of vegetation species observed with acronyms in the avian community response to habitat study in the Central Rocky Mountains, 1987-89.

TRDU Tragopogon dubius
TRIS Trisetum
TRLA Trollius laxus
TROL Trollius
TROV Trillium ovatum
TRRE Trifolium repens
TRSP Trisetum spicatum
URDI Urtica dioica
URTI Urtica
VACA Valerian capitutum
VACC Vaccinium
VALE Valeriana
VAMY Vaccinium myrtillus
VASC Vaccinium scoparium
VEAM Veronica americana
VERA Veratrum
VETE Veratrum tenuipetalum
VIAD Viola adunca
VIAM Vicia americana
VICA Viola canadensis
VICI Vicia
VINU Viola nuttallii
VIOL Viola
WYAM Wyethia amplexicaulis
WYET Wyethia
ZIEL Zidadenus elegans
ZIGA Zigadenus

Appendix D. Sampling effort (number of sampling stations on a plot times number of visits each station) for the avian community response study in the Central Rocky Mountains, 1987-89.

		1987		1988		1989	
Habitat	PLOT	EFFORT	# STATIONS	EFFORT	# STATIONS	EFFORT	# STATIONS
North Aspen	1	149	30	75	16	75	15
	2	150	30	72	15	75	15
	3	150	30	75	15	74	16
	4	150	30	75	15	75	15
	5	146	30	75	15	75	16
	6	150	30	75	15	75	16
	7	120	30	75	15	74	16
	8	150	30	75	17	74	15
	9	149	30	75	15	74	15
North Conifer	1	119	30	75	15	75	15
	2	149	30	74	15	75	15
	3	120	30	74	17	75	15
North Mixed	1	150	30	75	15	72	15
	2	150	30	74	15	75	15
	3	150	30	75	15	74	15
South Aspen	1	150	30	75	18	75	15
	2	150	30	76	15	75	15
	3	150	30	75	15	75	15
	4	150	30	75	15	75	16
	5	150	30	74	15	75	15
	6	149	30	75	17	75	15
	7	150	30	75	15	73	15
	8	154	32	60	15	75	15
	9	150	30	75	15	74	15
South Conifer	1	150	30	75	15	74	15
	2	151	31	75	15	72	16
	3	148	30	75	15	74	16
South Mixed	1	150	30	75	15	73	15
	2	150	30	75	15	75	16
	3	152	31	76	16	75	17

Appendix E. Level of pooling used to estimate detection probability of species observed during the Avian Response to Habitat study in the Central Rocky Mountains, 1987-89.

POOL ACROSS PLOTS, BUT NOT REGIONS OR YEARS: (7)

AMRO – American robin
DEJU – Dark–eyed Junco
HETH – Hermit Thrush
PISI – Pine Siskin
RCKI – Ruby–crowned Kinglet
WETA – Western Tanager
YRWA – Yellow–rumped Warbler

POOL ACROSS PLOTS AND YEARS, BUT NOT REGIONS: (1)

MOCH – Mountain Chickadee

POOL ACROSS PLOTS, YEARS AND REGIONS: (10)

BCCH – Black–capped Chickadee
BTHU – Broad–tailed Hummingbird
CAFI – Cassin's Finch
EVGR – Evening Grosbeak
HAWO – Hairy Woodpecker
HOWR – House Wren
LISP – Lincoln's Sparrow
RBNU – Red–breasted Nuthatch
WAVI – Warbling Vireo
WCSP – White–crowned Sparrow

GROUPED SPECIES TOGETHER, POOLED ACROSS PLOTS, REGIONS AND YEARS:

GROUP 1: (6)

AMCR – American Crow
BBMA – Black–billed Magpie
CLNU – Clark's Nuthatch
CORA – Common Raven
GRJA – Gray Jay
STJA – Steller's Jay

Appendix E. Level of pooling used to estimate detection probability of species observed during the Avian Response to Habitat study in the Central Rocky Mountains, 1987-89.

GROUP 2: (5)

DOWO – Downy Woodpecker
NOFL – Northern Flicker
RNSA – Red–naped Sapsucker
TTWO – Two–toed Woodpecker
WISA – Williamson's Sapsucker

GROUP 3: (6)

BLSW – Black–throated Swallow
PUMA – Purple Martin
RWSW – Rough–winged Swallow
TRSW – Tree Swallow
VGSW – Violet–green Swallow
WTSW – White–throated Swift

GROUP 4: (9)

ALFL – Alder Flycatcher
DUFL – Dusky Flycatcher
EMPI – Empidomax species
HAFL – Hammond's Flycatcher
LEFL – Least Flycatcher
OSFL – Olive–sided Flycatcher
WEFL – Western Flycatcher
WIFL – Willow Flycatcher
WWPE – Western Wood–pewee

GROUP 5: (11)

BHGR – Blue Grouse
CHSP – Chipping Sparrow
FOSP – Fox's Sparrow
GTTO – Green–tailed Towhee
HOFI – House Finch
HOSP – House Sparrow
LABU – Lazuli Bunting
PIGR – Pine Grosbeak
RSTO – Red–sided Towhee
SOSP – Song Sparrow
VESP – Vesper Sparrow

Appendix E. Level of pooling used to estimate detection probability of species observed during the Avian Response to Habitat study in the Central Rocky Mountains, 1987-89.

GROUP 6: (10)

BGWA – Black–throated Gray Warbler
BLBW – Black–throated Warbler
MAWA – Magnolia Warbler
MGWA – MacGillivray's Warbler
MOBL – Mountain Bluebird
OCWA – Orange–crowned Warbler
PIWA – Pine Warbler
TOWA – Townsend's Warbler
WIWA – Wilson's Warbler
YEWA – Yellow Warbler

GROUP 7: Similar to Ruby-crowned Kinglets (2)

BRCR – Brown Creeper
GCKI – Golden–crowned Kinglet

GROUP 8: Similar to Hermit Thrush and Western Tanager (3)

SWTH – Swainson's Thrush
TOSO – Townsend's Solitaire
VEER – Veery

GROUP 9: (Not enough to estimate detection probability) (14)

RTHA – Red–tailed hawk
ACCI – Unknown accipiter
BWHA – Broad–winged hawk
COHA – Cooper's hawk
GOSH – Goshawk
NOHA – Northern hawk
SSHA – Sharp–shinned hawk
SWHA – Swainson's hawk
TUVU – Turkey vulture
GHOW – Great horned own
NOGO – Northern goshawk
AMKE – American kestral
GOEA – Golden eagle
NPOW – Northern pygmy owl

Appendix E. Level of pooling used to estimate detection probability of species observed during the Avian Response to Habitat study in the Central Rocky Mountains, 1987-89.

GROUP 10: (Not enough to estimate detection probability) (8)

BUGR – Blue grouse
CONI – Common nighthawk
KILL – Killdeer
MALL – Mallard
SPSA – Spotted sandpiper
COSN – Common snipe
GWTE – Green–winged teal
CAGO – Canada goose

GROUP 11: (9)

BHCO – Brown–headed Cowbird
BRBL – Brewer's Blackbird
COGR – Common Grackle
EUST – European Starling
GRCA – Gray Catbird
RECR – Red Crossbill
RWBL – Red–winged Blackbird
WWME – Western Meadowlark
WWCR – White–winged Crossbill

HUMMINGBIRD GROUP: (2)

BCHU – Broad–chinned Hummingbird
RUHU – Rufous Hummingbird

VIREO GROUP: (2)

REVI – Red–eyed Vireo
SOVI – Solitary Vireo

NUTHATCH GROUP: (1)

WBNU – White–breasted Nuthatch

PIGEON GROUP: (Not enough to estimate detection probability) (2)

BTPI – Band–tailed Pigeon
MODO – Mourning Dove

Appendix F. Six most common species or genera in each of three vertical levels in the avian community response to habitat study in the Central Rocky Mountains 1987-89.

VERTICAL LEVEL	SPECIES NAME	FREQUENCY
0.0 - 0.3m	Carex species	1680
	Osmorhiza occidentalis	1150
	Poa species	989
	Agropyron species	909
	Calamagrostis rubescens	854
	Elymus species	698
0.3 - 1.0m	Symphoricarpos oreophilus	1023
	Ligusticum porteri	932
	Elymus species	928
	Osmorhiza occidentalis	790
	Agropyron species	742
	Pteridium aquilinum	507
1.0-2.0m	Abies lasiocarpa	544
	Amelanchier alnifolia	354
	Populus tremuloides	330
	Pinus contorta	176
	Symphoricarpos oreophilus	174
	Picea engelmanni	128